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ABSTRACT

This collection of 13 articles contains the reflections of experienced course developers on a particular course that illustrates the process of constructing flagship distance education programs. "Educational Developers in Action--A Series of Tales from the Mud" (Michael Parer) is an introduction that discusses the technology of distance education, distance and open learning, theory for distance and open learning, and comments on the following chapters. Two chapters in section 1 address the role of the educational developer: "The Role of the Educational Developer--Present and Future" (Michael Parer) and "Distance Education and Conceptual Learning" (John Sparkes). Section 2 on the educational developer in action contains eight chapters: "Swapping Hats in the Mud: Instructional Designer Turns Subject Specialist" (Noel Jackling); "A Tale from the Mud" (David Murphy, Gail Taylor); "Amber Waves of Grain" (Karen Murphy, Debi Rogers); "Course Development without Instructional Design" (Daryl Nation, Rob Walker); "Materials Production through 'On the Job' Training: A Case Study" (Fred Lockwood); "Creating a Course on Research in Distance Education" (Terry Evans, Ted Nunan); "Preparing History Courses at a Distance" (Alvin Finkel); and "The Virtual Laboratory: A Comic Book Approach to Teaching Laboratory Skills at a Distance" (Alistair Inglis). Section 3 offers some reflections by educational developers: "Developing Distance Education Courses" (Sue Warn et al.); "Critical Reflection on the Theory and Practice of Course Development" (Di Adams, Geoff Arger); and "Coming Back to the Question" (Larry Beauchamp et al.). (YLB)

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Developing Open Courses

Michael S. Parer

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Developing Open Courses

Centre for Distance Learning

Developing

open courses

edited by

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Educational developers in action – a series of tales from the mud

Michael S Parer
Centre for Distance Learning
Monash University
Australia

This book seeks to explore the issues that emerge with the educational developer in action. It presents to you a series of 'tales from the mud', stories of courses that arise from a creative process between the academic teacher and the academic support staff.

Distance education and open learning is at an exciting stage of development in Australia and around the world. For decades off-campus study has been seen as a second best option to the real university training with classroom lectures and face-to-face tutorials. Suddenly our politicians and funding agencies recognise that education and training can be delivered in non formal settings at the workplace, in the home by television and via the letterbox. We now hear terms like 'efficiency', 'effectiveness' and 'productivity' applied to new educational methods.

Those of us in instructional psychology and course development see this as a watershed point in public education. Our book *Development, Design and Distance Education* (Parer, 1989), which resulted from the 13th World Congress of the International Council of Distance Education, wrestled with the issue of clarifying the nature of educational development and instructional design within the field of distance education. That book is extraordinarily successful and is due for a third edition. It is a set text for three Masters in Distance Education courses around the world. In the preface I invited others with course development insights and experiences to write to me – and your comments have led to the birth of this current book, which has a different purpose.

I have asked experienced course developers to reflect on a particular course to illustrate the process of constructing quality flagship distance programs. I hoped the stories would emerge from the mud. I asked each to consider the initial gropings towards conceiving the

course, the story of how they actually mapped out the curriculum and first put pen to paper. I recognised that some would have highly structured methods and others would be far more open and discursive. I stressed that I believed that there was no correct way to write study materials, any more than there was a correct way to write a novel or a textbook. While I acknowledged there are certain conventions in writing study guides, I also stressed that these have evolved dramatically over the past decade. I encouraged each author to paint on a broad canvas and include aspects of study, assessment, project work, collaboration between students and broad issues of communication. This collection which has emerged from respected colleagues from around the world illustrates their methods of constructing courses.

An editor takes a considerable risk with such an invitation and Daryl Nation and Rob Walker's *Course development without instructional design* has some harsh words to say about professional course developers. I take this as a modest compliment for I see these two authors as part of the cluster of academics who espouse the principles that are gathered in the general bag of the course developer or instructional designer. The two courses they discuss are great examples of modern teachers wrestling with issues to make their distance courses meaningful for students. They are breaking out of traditional moulds and are pioneers leading their students to explore new ideas and seek applications to their professional lives.

Intended audiences

This book has several audiences. Firstly, academics new to distance education who are confronted with the awesome task of switching from on-campus teaching to writing their courses and trying to reconceptualise their relationships with students at a distance, instead of within the lecture room. Secondly, there are those academics within distance education units who are charged by their institutions to work with academic staff new to distance education. These staff are generally aware of the literature that has emerged from similar units and which builds on research projects undertaken by their colleagues. Earlier course development work depended on behaviouralistic techniques. The chapters in this book illustrate how techniques have moved dramatically and that there is now a whole spectrum of theoretical underpinnings to the field of course development.

Academic administrators form a third audience. I hope this book helps them become aware of the complex and highly skilled requirements

of academics who strive to engage in the design and writing of distance courses.

So a new book is born. The draft chapters were put on a computer disk and shared with all the contributors so that they could see the book emerging before publication. I thank all who gave their comments.

I also thank Rae Hill for the onerous task of preparing the manuscript, Norman Hurrell for book and graphic design and Sharon Shaw for the cover design. Special thanks are also due to Robyn Benson and Maxine Fine for their detailed editorial work which has enhanced all these contributions.

Profession of educational developer

The profession of the educational developer is at a critical stage where members can make a significant contribution to training and education, or they may be simply bypassed. It may be a truism that good teaching has always been a mixture of content and method. Today content is expanding expotentially and it is difficult for specialists to keep up to date within their field. We also know that methods of teaching are continually changing with research and technology. This should be no surprise, for teaching methods have evolved in the western world continuously from the Socratic method of questioning, to rote learning in monastic traditions, to the spirit of enquiry during the scientific revolution.

Today we are experiencing the demand for mass education. Distance education offers a mode of delivery that is labelled the industrialisation of education. There is a danger that this model will dominate the decisions of educational planners and of teachers.

Recently I was a privileged guest in Iran at the Shahed and Payame Noor Universities to offer a series of staff seminars on distance education. In Iran it is dramatically obvious that distance education is in its infancy – it is less than 20 years old. It is also easy to see that it is the industrialisation of education. This was illustrated at Payame Noor which began five years ago and within three years had 32,000 students – more than the attendance at Iran's University of Tehran. Today there are 312,000 students in Iran's conventional universities and 70,000 students at Payame Noor Open University. Already this distance university comprises 20% of Iran's higher education students. Within another five years it will grow to 200,000 students

with 200 large study centres as mini university campuses spread throughout the country. With this trend, by the year 2000 Payame Noor Open University will have more than half of all higher education students studying at a distance. The same pattern has already been repeated in Thailand, Indonesia and Sri Lanka, and a similar pattern may be seen with the Open Learning Agency of Australia which uses television and the mailbox to bring training to new groups of people.

Process of development

With this book I used another process of interaction before final publication. A developmental edition was used at the pre-conference workshop at the 16th World Congress of the International Council for Distance Education held at Sukhothai Thammathirat Open University in Bangkok. These stories were used as the point of discussion with 86 colleagues from 23 countries. Their reflections on them have been added as an additional chapter. This is part of my aim to make the traditional book an interactive process.

The working title of this book has been 'Developing distance education courses'. The term 'distance education' was accepted by the International Council for Correspondence Education at its 12th World Conference in Vancouver, Canada, in 1982.

For a decade the use of the words 'distance education' gained a reluctant acceptance after 'external', 'extramural', 'off-campus' and 'correspondence studies'. Many have always had misgivings about the appropriateness of the term 'distance education'. Alternatives such as 'open' and 'flexible learning' seemed to incorporate and extend the philosophies and structure of distance education centres.

The Australian Commonwealth Government has negotiated with Monash University to establish an Open Learning Agency that could well become The Open University of Australia and incorporate and extend all the activities of distance education. In Australia open and distance learning are in danger of being fused together, but they are very different in concept.

I have changed the title of this book to *Developing open courses* as I see it reflects the future direction of course developers. Nonetheless I wish to emphasise that there is a difference between distance and open learning. This difference is stated in a paper that I presented with France Henri (1993) at the Asian Association of Open Universities in Hong Kong.

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Technology of distance education

The technology of distance education is based on scientific knowledge taken from various disciplines such as learning psychology, cognitive science, communications and management. This know-how requires a commitment to three principles, namely:

- detailed design that is the integration of all pedagogical elements, instructional strategies and assessment through detailed planning and development;
- field testing and formative evaluation of instructional materials;
- the provision of student support.

The technology of distance education is an integrated system that covers the academic, administrative, production, delivery and support system. The prime concern of such a system must be the academic or pedagogical teaching, learning and certification of the students. It is easy for tensions and conflict to arise between the academic and the administrative structures, between content, pedagogical and media experts. (Parer, Croker and Shaw, 1989)

Distance education for mass education is based on the theories of the structured industrialised process in which many specialists contribute with the teacher to share the 'teaching' responsibility. On their parts, students are expected to take responsibility and initiative for their learning which occurs when knowledge is presented in the learning materials and reconstructed within the context of their current knowledge and belief systems.

The technology of distance education, in our understanding, is a know-how of processes and procedures to implement mediated teaching and to facilitate learning. The technology of distance education is often seen as audio, video, computer conferencing, CD-ROM and the high technologies. In fact the technology of distance education has its own dynamic and is not necessarily dependent on these high tech components, although they should be used where appropriate. Distance education has been characterised by the use of traditional technologies of print, audio and videotapes and correspondence. Yet the immediate future may be different with the influences of the cognitive sciences that are enabling us to understand the process of learning, with the use of desktop publishing and new computer communication technologies that allow for multiple formats to present information and communication.

Distance and open learning

Some have argued (Jevons and Guiton, 1992) that distance education is not essentially different from the general pedagogy of education. We disagree and see essential differences in the isolation of the learner, self-management of the learning process, individual rhythm of learning, autonomy, no social and intellectual campus life, teaching is all mediated and so on. Fundamentally good teaching has always involved the development of content and methodology. This remains true in the classroom, in television open learning and in distance education, but the pedagogy and methodology is vastly different for each.

At times open learning and distance education are used synonymously, yet there are clear differences. The principles of open learning are:

- open entry to study;
- maximum of electives and minimum of prerequisites;
- participation in the selection of studies;
- choice of when, where and how to study;
- recognition and credit of prior learning whenever and however it was achieved;
- choice of when and how to be assessed. (Johnson, 1993)

Open learning is primarily a goal or an educational policy which is built around the geographical, social and time ideals of the individual learner rather than those of the educational institution.

Bates (1991) argues that distance education is one means to that end; that it is a flexible, yet structured way in which students can study in their own time, place and pace without coming to on-campus lectures. It is important to re-emphasise that open and distance education are rarely found in their purest forms. Large systems are unable to be completely open, and few students study in complete isolation.

Both open and distance education are new modes of delivery and require adjustment from teachers at traditional universities. In the context of the move from traditional to distance teaching the role of the educational developer is seen as the bridge builder between the academic staff and the distance education system. Most university lecturers have been enculturated into classroom teaching on-campus and the academic colleague who is an educational developer has

a role in helping staff to design pedagogically effective courses using the modes of distance and open learning.

With respect to the quality and open learning nexus, a number of major operational and philosophical issues arise for distance education management. These include the:

- blurring of product or course boundaries
- cheapening of the product image
- competition driven by price not quality
- internal competition and conflict for course content designers
- outcome uncertainty
- disincentive to pursue excellence in the high value product range
- purpose of higher education
- role of the university as a fountain of knowledge and wisdom
- re-emergence of the binary system stratification
- staff disillusionment and instability
- opportunities for growth
- pressure to examine new technologies
- review of strategic and business plans
- pursuit of individual opportunities and status
- role of the media in shaping the product and its content
- packaging and retailing of a traditionally inaccessible product.

(Cree, M. 1993)

These new modes of education have already brought into higher education new groups that have been neglected in the past. People scattered in rural areas now have the opportunity to study at home for university degrees. Older people at work, mature students who have missed earlier opportunities to go to university, are now becoming part of the lifelong learning process. And women, who throughout the western world have been under-represented, are now gaining equality in higher education. In Australia over 50% of distance students are now women, and during my time in Iran the President, Mr Rafsangami said he would not rest until half of the Iranian students in higher education were women. Distance education offers an extraordinary opportunity to new groups in higher education.

Theory for distance and open learning

This book does not explore the theory of distance education, but it is difficult to avoid reflecting on the philosophies that emerge from the widespread use of this mode. One of the first important researchers in distance education was Otto Peters from Germany, the first Vice ·

Chancellor of the Fernuniversitat. He coined the phrase that distance education is the industrialisation of education. He reflected on two forms of higher education. The first was the face-to-face oral tradition with spoken lectures and personal contact that is the basis of conventional teaching and the second was a new industrialised process based on mass production. In his research he found that models of education were based on teaching methods that had been with us for 1000 years. It was lectures, tutorials, personal contact, living on-campus and people spending all their time as full time students. He found this model inadequate and began to look for another that would explain this new mode of education. He looked to business and saw the industrialised process in factories. He noted that the first correspondence classes, lessons and courses began at the same time as the postal service began and railways were being constructed. He compared the face-to-face classroom model to the craft model, as a shoemaker who made a pair of shoes with each pair unique. He saw that traditional face-to-face teaching was built on the craft model and that the teachers' lectures and teaching was individually crafted to the particular group. In distance education he saw industrialisation and the division of labour – that some people wrote the study guides, others printed them, despatched them, supervised the study centres and others corrected the assignments. He noticed the mass production where lecturers were replaced by sets of study guides that could be distributed to thousands across great geographical distances. He noted the planning, preparation and production in large business with standardisation of production. Finally he saw that distance education methods lent themselves to a monopoly that was easy for a government dictate as a new way of education with a single system for a whole country.

Many elements in Otto Peters' theory of industrialisation of education express the reality of distance systems which enables thousands of new students to enter higher education. His theory however needs to be balanced by that of Borge Holmberg from Sweden who insists that distance education must have a human face. He stresses the importance of guided personal conversation which is both simulated and real. Simulated means that study guides must provoke students to think about the subject and apply it to their professional lives. It is simulated because it should encourage students to discuss issues with their families, friends and people at work, and to apply it to life as much as possible. He notes that real conversation is continued through assignments and vac schools. He stresses that the theory of the industrialisation of education needs to be balanced by guided teaching conversation.

Another important writer about the theory of distance education is Michael Moore who recognises that distance education involves adult students who take responsibilities for their own learning. The philosophical tradition of phenomenology has been of great importance because it stresses that true learning only takes place when students reconstruct ideas and skills within the context of their ideas and skills. Further, phenomenology stresses that adult students bring a whole set of life experiences to study and that these experiences are part of the curriculum. It is impossible to ignore these experiences in any subject that is studied. Theory in distance learning is critical as the course developer tries to make sense out of the practices and produce flagship courses that will improve students' lives.

From the beginning of correspondence teaching the assumption was that a good teacher could automatically teach at a distance. But in the 1970s, when distance education emerged as a means of mass education, an industrialised teaching process was set up and the functions and tasks of the teacher were broken down. They were spread among various specialists who became partners to share the responsibility of the pedagogical process. Educational developers, media producers, editors and publishers joined the teacher to prepare distance education courses and materials. Traditional teachers were then considered as the 'content expert' specialists. In all experiences there was a varied and mixed commitment to educational development, instructional design and the technology of distance education. Most programs of distance education have achieved degrees of success but have also been characterised by large student dropouts, failure to graduate in minimum time, intermittent student support and dependence on residential components to compensate for the lack of well developed distance teaching materials.

Typeface used in this book

I have already made some comments about the process of preparing this book. Now I want to reflect on a specific aspect of its presentation, namely the typeface that is used. The educational developer must take an interest in the textual presentation of study materials and this interest must continue with the growth of desktop publishing. One aspect of textual presentation is the choice of whether to use serif or sans serif. Typefaces without serifs appear

cleaner and more modern. Questions arise about the readability and legibility of each.

There are over 10,000 typefaces and each has its own style of authority, distinction, power, lightness or humour. It may well be that they are called faces because each has its own personality and character. Many have a rich history and some stonemasons, such as Eric Gill, have established an international reputation by the creation of a new distinctive typeface.

I am indebted to David Sless of the Communication Research Institute of Australia for his significant contribution to my understanding of text for communication and the background to various typefaces. For example, the Carlson Open Face has an eloquence of the eighteenth century copperplate inlay that creates an atmosphere for legal documents but makes it unsuitable for a computer manual or a plumber's account. (Sless, 1992)

The two typefaces that have attracted greatest interest for me are Times and Helvetica. Indeed, most typefaces seem to be derivatives of these two. Both have histories that help us decide when it is appropriate to use them. In this text I had to argue with many colleagues between the use of Times and Helvetica. As is obvious to all, I decided on Helvetica.

Let me again acknowledge David Sless as my source and spell out something of the history of these typefaces to try and indicate why I made the decision to use Helvetica.

Times New Roman was based on the Venetian typefaces of Nicholas Jensen. These emerged early with printing and were based on the handwriting of Renaissance scholars. The serifs of the calligraphers' quills were retained. Stanley Morison of the Monotype Corporation had as his brief the design of a typeface for the *Times* newspaper in 1932. He increased the x-length of letters, that is the lower sections of b, d and h, to improve legibility; he also narrowed the letter shape to fit text into a newspaper column as economically as possible. Morison also used sharply cut serifs to suit the harsh newsprint and high speed printing drums. This typeface quickly found acceptance for use in books, journals, magazines and job printing. Today some think Times is too heavy and uninviting when used with high quality paper and improved printing presses. Helvetica is a typeface designed for the age of technology and was used for European signposts in the 1960s. This face emerged from

the Bauhaus movement that sought simplicity and functionality in architecture, industrial design, photography, sculpture and construction. The Swiss typographers sought to put the Bauhaus ideas into practice so they removed all traditional and calligraphic connection – and Helvetica was the result. Its appearance is modern and excellent for display of signs and advertisements.

Many argue that the serifs help legibility and that without them reading becomes tiresome and strains the eye. However research has not confirmed that serifs assist in recognising word shapes, guide the eye from one word to the next or assist in recognising sentences rather than words. Rather, differences in legibility depend on familiarity (Reynolds, 1991), what the individual is used to (Tinker, 1963), and what the reader finds most pleasing (Burt, 1959). The conclusion is that there are no black and white recipe solutions. The decision depends on the context and acceptance by the reader.

In this book I chose Helvetica, firstly because the large x-height made the text far easier for me to read as I enter my middle years, and secondly because it gave the text a modern feel. Since this book is about exploring the future role of the educational developer I judged Helvetica more appropriate than Times.

The educational developer in practice

The chapters in this book show that the course developer acts in idiosyncratic ways. Each has a special way of doing things. It is difficult to find common threads about how the profession should move forward. I make no apology that these theories do not emerge in this book. This book is a collection of experiences where colleagues reflect on their work.

Let me offer a few comments on the chapters that follow.

I am glad that **John Sparkes** persuaded me that his chapter fitted the context of this book. I recognise that he is one of the few who seeks some theoretical construct on the activities in developing distance education courses. John Sparkes deals with pedagogical issues but, in contrast to those who emphasise disorderliness and muddiness in the creative aspects of course development for distance education, he takes a scientific-engineering approach, wishing to 'drain the swamp' a little and predicate course design on an understanding of

the learning process. Consequently his contribution is significant in the analytical perspective that it brings to the task of developing higher level learning skills in distance education students. He distinguishes between the teaching of knowledge, skills and understanding, focusing on the greater explanatory power which is possible with conceptual change learning. He offers a diagnosis of why conceptual change learning often does not take place in higher education and suggests some strategies for its implementation. His prognosis builds upon the concepts of deep and surface approaches to learning and he clearly shows how disciplined analysis in the selection of learning tasks to meet the desired learning outcomes can go a long way towards achieving them with some measure of certainty.

Noel Jackling's chapter in our previous book highlighted the important concept of course developer as a joint venturer. This highlights the valuable role that metaphors can play in evolving and clarifying our concepts. His chapter explores the dilemmas of the course developer who switches hats to become a content writer. He tries to bridge the two worlds of teacher and developer.

David Murphy and Gail Taylor's tale from Hong Kong Polytechnic is another description of the successful development of a particular distance education module which illustrates the workings and value of dialogue between instructional and content specialists when this is conducted in an atmosphere of openness and exploration. The development of their module 'Studies in practical garment design' further indicates how this process can lead to innovative ways of tackling the kind of distance education problem often faced in subject areas which have a large practical component. Often the result is potentially more relevant to the student's needs than traditional classroom practice. Murphy's reflections provide theoretical insights into what happens in the course development process, linking well to the consideration of theory and practice by Arger and Adams, and the use of a constructivist approach to curriculum enquiry modelled by Beauchamp, Haughey and Jacknicke. Murphy uses chaos theory to help explain the essential 'muddiness' of the creative process, while the use of dialogue in the presentation of the chapter, as in the contribution by Murphy and Rogers, cleverly underlines the cooperation, open-endedness, lack of structure and apparent inconclusiveness which seem to establish the best conditions for the development of tightly structured, forward looking and relevant education experiences.

Karen Murphy and Debi Rogers provide a further description of the development of a particular distance education offering – in this case a Cereal Science university course for graduate and upper level undergraduate study. This chapter also provides illuminating insights into the dialogue between instructional and content specialists, reflected in its presentation in dialogue form. While the description of the evolution and implementation of this course illustrates the importance to course development of dialogue conducted in an atmosphere of rapport and understanding, it also provides a vehicle for conveying some useful course development hints – not only in relation to print media, but involving the use of videotape, teleconferencing, fax and provision for the development of practical skills, as these were essential components of the course.

Daryl Nation and Rob Walker describe their construction of two courses, *The Sociology of Educating* and *Classroom Processes.* Their title *Course development without instructional design* will provoke a response from course developers who see in both these academics a high level of professional judgments that developers seek to apply in their work. This chapter highlights the fact that there is no single optimum way to design an open learning course but rather each is unique. Just as many architects who design hospitals each bring their own special skills, background and ideas to plan appropriate but very different functional structures, so too teachers and developers wrestle with the best way to construct courses. Their chapter indicates that we are continually evolving our ideas and attempting new ways to improve our skills to bring about conceptual change in our students which, as John Sparkes reminds us, is the only learning that is high quality education.

Fred Lockwood's contribution also describes a distance education approach taken within a particular institution and setting, while conveying messages to the practitioner beyond that context. However, while Brahmawong, Arger and Adams paint on a broad canvas, Lockwood focuses on a particular issue, that of preparing a self-instructional 'on-the-job' training package for a specific audience, within a limited time-frame and modest budget, and with authors who had no experience of writing self-instructional material. The importance of developing and adhering to working assumptions, strategies and schedules in respect of a particular task is clear from the outcome; its successful completion, with the added benefit of the development of transferable skills by the authors, is testimony to the value of careful and realistic planning and implementation.

Terry Evans and Ted Nunan describe how particular challenges in the creation of a distance education course were overcome. In the development of the *Research in Distance Education* course a major concern was the need for adequate preparation and guidance in the students' research and theses writing. They focus on the pedagogical issues inherent in selecting, structuring and assessing the learning tasks to achieve their goals, noting that these decisions always represent the application of beliefs about teaching, learning and the social purposes of a course. These issues are similar to Beauchamp, Haughey and Jacknicke's experience, while their references to the critical reflection and creative leaps involved are reminiscent of both Arger and Adams, and Murphy and Taylor. The creation of order seems to require the absence of order and the existence of 'permission' to engage in wide-ranging exploration, trial and error and reflection.

Alvin Finkel from Athabasca University speaks of his experience of working with course developers over a period of 13 years. Not all of his reflections are complimentary and I found myself wondering whether this was because of issues of personality or whether it was inherent in two diverse professions seeking to work together.

Alistair Inglis has been a close colleague for many years. We have had our differences but I have always admired that he offers a different perspective on issues of theory and the meaning of instructional design. He always brings a provocative and interesting point of view and is currently undertaking his doctoral research among course developers throughout Australia. I look forward to the result which will flow from his interviewing all practitioners in instructional design in higher education throughout Australia.

The Mayfield Centre in Melbourne has been offering medical training at a distance for a decade. **Sue Warn, Leigh Brown and Terlochan Chemay** describe how they were intuitively drawn to distance education and by hard work, trial and discovery learnt of course development. This is a familiar and salutary lesson to many of us.

Di Adams and Geoff Arger describe the course development process in a particular setting – in this case the University of New England (UNE) in Australia – as an example of a dual mode institution. They too note the need to acknowledge contextual characteristics which they use to argue the importance of pragmatism in dealing with the dynamics, including the often competing values of the individual situation. However, they see critical reflection as working hand in

hand with pragmatism 'to inform intuition and to enhance professional judgment'. In describing strategies undertaken at UNE, they show how this process has been implemented. Their work, therefore, is helpful in conceptualising how practice and theory – the particular and the general – are related in course development: the dynamics of the particular situation being informed, but not constricted, by the general principles established from the experience of others.

Larry Beauchamp, Margaret Haughey and Ken Jacknicke's experience of developing a distance education course relates to a graduate level offering in curriculum inquiry following a constructivist approach. Their chapter illustrates the creative aspects of the course development process as they wrestle with problems such as providing guidance for students while rejecting the notion of a 'pre-packaged program' and encouraging them to use their own experience to explore relevant curriculum issues. Through brainstorming and reflection, the problem-posing approach which was developed asked students to relate each topic to personal knowledge, exposed them to the perspectives of different curriculum scholars, and encouraged them to move forward to the development of new knowledge. The use of interactive techniques and the inclusion of workshops provided further opportunities for individual exploration and reflection as did the assessment procedures in which the creation of a personal journal played a key role. Piloting of the course with on-campus students provided valuable feedback for revision.

As I mentioned in the previous book, those of us in higher education must not simply be the transmitters of knowledge but be discoverers of new knowledge and applications through our research. It is only by continually undertaking such studies that we will remain on the cutting edge of our profession. If there is one desperate need that I would single out as being important for our profession, it is for an increase in the output of research that contributes to our effectiveness.

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Section 1

The role of the educational developer

CHAPTER 1

The role of the educational developer – present and future

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The educational developer as an academic support staff is an integral part of many institutions offering distance and open learning. The past few years have seen a growing demand for this professional contribution. The role continues to be a delicate one and is not always well understood and even at times criticised by those academics who are involved with them in the development of quality distance courses.

This chapter considers the role and the activities of the educational developer in distance education. In other places we have sought to add to the literature of the academic dimensions of role through our two books, *Development, Design and Distance Education* and *Developing Open Learning Courses.* (Parer, 1990, 1992)

We use the term 'educational developer' in preference to 'instructional designer', 'educational technologist', 'distance education consultant' even though it acknowledges that all of these terms are used as generic descriptions of the role.

This chapter analyses the role of an educational developer from the descriptions given of the day to day activities of 75 academic staff from 23 countries who participated in the 1992 International Council for Distance Education pre-conference workshop held at the Sukhothai Thammathirat Open University in Bangkok. Prior to this event each participant was asked to provide statements on: the theory that best informed their work; the metaphor that described that work; a list of ten items that described their daily activities; and finally an example of a study guide that represented their work.

This chapter considers the responses to the third question and, following this analysis, will reflect on the meaning of these for the immediate and long term future of the educational developer in open

and distance learning. I thank my colleagues for contributing their statements and allowing them to be used in this report.

This analysis was undertaken using the qualitative software program Nudist – non-numerical, unstructured data searching and theorising. The nine broad categories that emerged were:

1 Illuminating educational issues and problems
2 Learning processes
3 Instructional design
4 Coherent media environment
5 Communication and support for students
6 Adapting to a team culture
7 Research
8 Professional development
9 Administration

Let us turn to the detailed descriptions given of educational developers' activities.

1 Illuminating educational issues and problems

Quality is the emerging theme in distance education and the responses showed a concern for nationwide and professional standards, a sensitivity to professional organisations and the over concern of some educational administrators to meeting the political demands for quality, rather than achieving quality to service the needs of students. Further concern related to accrediting bodies – to ensuring that the courses met the requirements of students entering the professions; and that external assessment authorities should be satisfied with the syllabus. Others saw the course content and curriculum as primary and that part of the responsibility of the educational developer was to reflect on it as a surrogate student. Some mentioned the importance of providing links between educational institutions and industry so that educational offerings were in touch with actual needs of the market place.

2 Learning processes

This category covered the broad spectrum of teaching and learning and included such concepts as anticipating the learning process; blending instruction and activity; creating multiple pathways; determining what is to be taught and the sequence so that skills, knowledge and understanding are enhanced; developing conceptual

structures for learning materials; establishing specific objectives for each segment; ensuring that objectives reflect competencies demanded in a professional role.

Many of these ideas were filled out with descriptions, for example:

> I regard the analysis of content structure as being critically important to the development of effective materials. Consequently, I always try to engage with the subject specialist in an attempt to map the content prior to the development of the first draft.

Another description was:

> Materials that we produce endeavour to fit into the following principles: the material is flexible, that it caters for a variety of students, is learner centred, provides common core elements, is high quality, and is developmental, sequential and integrated, covers all curriculum requirements, acknowledges teachers' involvement in the material and the learning environment and family resources, has an awareness of technology links and is based on sound principles of instructional design.

and another description in trying to grasp the learning process was:

> I never know how much they already know, because their existing knowledge is embedded in the expertise of professional practice which they are probably not able to describe because it is largely tacit, and which I cannot directly absorb because of the distance factor.

Finally there were some statements on the role of the developer related to the learning process that spoke of the role as that of a surrogate student, of ensuring that the material substitutes for a face-to-face course, that the students are made to be responsible for their own learning and progress, and trying to remember what it was like to be a distance learner.

3 Instructional design

Some educational developers saw their role under this heading quite clearly:

> I am a safety net for writers, I act as go-between for writers and their heads of school and writers and the off-campus system; I act as nursemaid and psychotherapist; I network; I supply resources; I provide original ideas, criticisms and activities; I edit – if the writer is hopeless, I write; I represent the student; I educate in instructional design.

Many others saw themselves as crucial in conceptualising the content, participating in field study surveys, in gauging needs in proficiency; reading related literature; identifying problems; providing instruction and comments to course writers. Indeed the thrust is to allow the content, the context and the intended outcomes to influence the final instructional design and style of presentation.

A number referred to the importance of designing learning activities that enable the student to learn from experience. Some argued against the assumption that all our actions are guided by conceptual knowledge:

> experience shows that where there is a choice between such knowledge and experience the student will act in accordance with the latter. Consequently the design of learning activities must be presented in ways that give the students new experiences which can become the basis of more appropriate actions.

Most of the responses in this category referred to the generally understood role of the course developer as working with the team to develop outlines for the first draft, setting priorities in content, expressing objectives in terms of student outcomes, paying attention to the writing of course objectives, continually revising content and coordinating recommendations of course team members.

Others stressed the importance of writing lessons in the learners' language with a degree of difficulty that would increase understanding in vocabulary; the importance of giving time for writing and activities. Others spoke of the importance of organising the material, structuring the course, giving indications of where to pick up the pieces for students when things went wrong.

Others wished to provide templates, tools and models for course writers, particularly for those finding difficulty to get started. Some spoke of the importance of the developer as an outside viewpoint to see the package as a whole and remove inconsistencies, to help the students make their own reflections and dialogue with the course,

and ensure the assignments and the questions that emerge help the students integrate theory and practice.

Others stressed the importance of the learning pathway –

> the single most important requirement for me is the provision of a clear learner path. The consequence of this is to ensure there is a logical sequence to the materials which therefore will be generally hierarchically structured.

Some few others spoke of the role in this category as –

> editing and checking content, continuity, readability and understanding; of editing on a number of levels for layout, language, style, so that the role as editor was not simply proof reading but was offering challenge, clarity, organisation, variety, practicality, opportunity for hands-on, up-to-date examples, demanding knowledge and cogent arguments and allowing negotiation of the student tasks.

4 Coherent media environment

There was a strong emphasis on the importance of visualising the situation for the learner and developing appropriate forms of communication. While there was stress on using alternatives such as CD Rom, radio and multimedia non-print aids and introducing alternative and innovative features, the main emphasis had to do with:

> combining text, graphics and layout so that they support rather than overwhelm the product. I believe that the function of typography, graphics and layout and instructional material is to make it easy for the student to see relationships between the textual elements and to engage with the content rather than with the appearance. This is a distinctly different focus from that adopted by many graphic designers who see the purpose of presentation as being 'to create interest'. However, 'creating interest' can be viewed as 'creating a distract', depending on what perspective one is coming from.

Others spoke about incorporating graphics with pictures and diagrams to enhance the visual impact and selecting necessary artwork to support teaching and presenting the manuscript for publication and that:

> page layout and text design are important features in motivating the students and retaining students' attention.

One respondent stressed the importance of using illustration without supporting words to reinforce those who think visually and for whom an illustration can be a powerful teaching device.

5 Communication and support for students

An underlying theme for many in all their instructional design work was effective communication between students and teachers. The emphasis was that materials should motivate the students to maximise their studies and provide lecturers with the reactions, the thoughts and the feelings of the students about the course and help them with effective study methods. There were also remarks about communicating with students through assignments, teleconferences, letters and vacation schools.

6 Adapting to a team culture

Respondents had a strong commitment to developing a team approach. Educational developers see themselves as part of a team within the school or faculty and the link and bridge builders to the development, production, delivery and student support processes.

This role of being part of the team is expressed by phrases such as: being accessible to writers, students and lecturers; being diplomatic when confronted with conflicting opinions; briefing and working with others; consulting other members of the writing team; encouraging writers; persevering in ambiguous circumstances; providing an overall design brief; sharing perspectives; withdrawing gracefully in negative circumstances – to wait for the opportune moment; interfacing with work already done by a predecessor, liaising with external course writers, with graphic designers and the production section. The general philosophy seemed to be summed up by one:

> I much prefer working as a full member of a team. The role of consultant may be safer. However, diminished responsibility generates diminished commitment which leads to a loss in sense of reward.

7 Research

Educational developers are academics by appointment and so have a responsibility to engage in research as part of their academic role. This is often difficult for others in the university to accept for they see research as primarily content and discipline oriented.

All see formative evaluation as integral to their role:

> I am very dependent on evaluation, generally open ended and collective to tell me something about outcomes since project assessment has such a large degree of uncertainty associated with it.

Responses included the importance of student feedback, evaluating programs in their embryo stages, testing criteria, monitoring results, participating in testing and making corrections, evaluating course materials and student support systems, receiving feedback from academic departments and administrators. All of this implies the establishment of a relationship between students, writers and the educational developer so that the results revealed in evaluations are accepted and fed back to improve the course.

Another category of research was the gaining reliable insights into the quality of the actual practices of educational developers. Others emphasised the importance of relating practice to theory, of research in the area of educational media and the problems which students experience in evaluation and delivery of hardware.

8 Professional development

Responses in this category fell into two sections. The first was staff development for those with whom educational developers work and the second with their own professional development. Many spoke of assisting academic staff in reviewing their existing courses, developing models, keeping pace with developments in distance education learning, instructional design and state of the art technology, and the need to train and offer guidance to new writers.

Points noted regarding their own professional development were: the importance of reading literature on the field, managing stress, not getting upset, remaining optimistic, having fun, sharing in the pride of a job well done and working under severe time pressures.

9 Administration

Educational developers saw themselves as part of the administration for the design, development, production and student support process. They were required to read documents to understand the legal and bureaucratic parameters; to supervise the course team; commission suitable texts and support materials; liaise with client groups, negotiate on all aspects of the course, for example, with teachers to ensure suitable loads and with hardware and software agents to gain the maximum resources for the minimum financial outlay.

Educational developers saw themselves as administrators in organising and submitting corrected course proposals, managing and controlling course development, writing up status reports, envisaging slippage and figuring out solutions. Some were responsible for managing the production of external materials, writing to copyright holders for permission to reprint materials as supplementary readings and for supervising the production process.

Conclusion

The above gives some indication of the wide spectrum of activities that the educational developer engages in. In many ways they are the bridge between the distance education support systems and the academic faculties. They have a foot in both worlds and need to ensure that both the academic and production systems operate efficiently. As a result of discussions at the workshop five areas of priority emerged.

Educational developers need a clear theoretical perspective to inform their practice. Currently this embraces a balancing of several theories, namely distance education as the 'industrialisation of education' as presented by Otto Peters, the foundation vice chancellor of the Fernuniversitat; and the importance of seeing distance education as 'guided didactic conversation' of Börje Holmberg; and more recently the general philosophical perspective of adult learning and phenomenology which stresses that deep learning only takes place when students reconstruct ideas within the context of their existing belief systems and that the life experiences form part of the curriculum for any adult studying at a distance. Educational developers must construct their own theoretical perspective and it is important that they have a theoretical framework to inform their professional practice.

There is no single best way to construct a distance education program. Each course must fit within the demands of its curriculum and make use of the media most suited to it.

There is some tension between educational developers who work within the systems approach where courses are designed in a framework with the sequential analysis of needs, tasks, concepts, target population, context, and the importance of behavioural objectives (Gagné and Briggs, 1974); and those who concentrate on the primacy of the creative approach where the role of the educational developer is to encourage all in the course team to contribute from their own experiences and creative insights (Wiman and Meierhenry, 1968). The systems approach developer generally argues for a centralised model and format with metaphors taken from engineering and the physical sciences and is comfortable with the title of instructional designer; the latter sees value in aspects of a decentralised model, utilises metaphors from architecture, medicine and literature and prefers the title of distance education consultant or instructional psychologist. In practice most developers use a mixture of both approaches.

Study materials are a complex mixture of pedagogical and personal teaching methods and are not simply the replacement of lecture notes. The stimulus study materials are in lieu of lecturers in distance education where students are separated from the teacher and the institution. Therefore study materials must contain all the dynamic elements that are present in the traditional face-to-face teaching. Study materials need to include the multi levels of communication that take place verbally in the classroom. These need to be explicit in the written study guides with a mixture of personal, didactic and discursive styles. Thus, the teachers should inspire and motivate students with enthusiasm for the subject and personalise the study materials from their own experience; secondly, a good teacher clearly expounds and details the course so that there is no ambiguity for the students; and thirdly the study materials should contain discursive elements that ruminate around the subject such as a good teacher. uses in answering questions or responding to confused expressions among students.

The educational developer works to ensure that students have a clear overview of the learning pathway. Students are free to follow this pathway, although amongst adult learners we expect that many will choose their own direction. However, a clear pathway enables

all students to know the direction and return quickly when confused. Further, distance education materials need to be presented with continuous activities so students are continually asked to build on their life experiences and reconstruct new ideas within the context of the ideas they already have.

We have argued that educational development supports new elements that continually emerge in the technology of distance education and to day these are particularly:

- new insights from cognitive psychology that expand our understanding of how adults process information and grow as deep learners;

- desktop publishing, already pervasive in the business world, is now widespread in academic institutions. Desktop publishing empowers the writers to take responsibility for many of the roles that traditionally have been those of the graphic designers and compositors. Many writers may run riot with the wide variety of selection in desktop publishing and this has led to a changing of the role of the educational developer to ensure that academic writers use the power of desktop publishing efficiently and to enhance student learning;

- major development in communication technologies which will impact on distance education with computer mediated conferencing. Some see CMC as an incredible opportunity for the future to change the status of distance education (Henri, 1992).

I wish to conclude this chapter with a few observations about the changing perspectives of distance and open learning with the advent of desktop publishing and computer mediated conferencing. Both these are greatly enhanced by the involvement of the educational developer.

The advent of desktop publishing has modified the role of the educational developer and often gives rise to tension within the centralised model of the industrialised approach. Part of the role of the educational developer is to resolve this dilemma and advise on instruction and textual design. The aim must be to ensure the efficiency of the total operation and at the same time protect the freedom of academics to develop courses that are dictated by the pedagogical needs.

Computer mediated conferencing seeks to bring didactic conversation to the computer age. Several research projects and experiences (Mason and Kaye, 1989, Harasim, 1990, Kaye,1992, Hiltz, 1985, Henri, 1992,1993) suggest that developments within computer conferencing offer a possible breakthrough to change the whole concept of distance learning and 'computer conferencing will probably find a place alongside face-to-face and distance education while at the same time changing the nature of traditional multimedia distance education' (Rekkedal, 1992).

With the use of CMC the future Virtual University will take care of the professional, educational, administrative and social functions and will be accessible from anywhere, at any time and will be able to satisfy interpersonal communications. CMC is suitable for teaching conversation, peer and group learning, the distribution of information, two way communications between tutors, counsellors, students and administration, alternatives to face-to-face teaching, group discussion project work, public tutorial, peer counselling, free flow discussion, library access, staff meetings, registrations, development and distribution of course materials. Computer conferencing does offer a new way to communicate at a distance with students.

Questions arise as to how computer conferencing relates to the important concepts of open education such as flexibility, free or fixed starting dates, pace and individualised study, but it appears well suited to distance education.

Educational developers engage in a wide range of activities. They are the bridge builders, the reconcilers between the academic faculties and the distance education support systems. They are academics with a foot in both worlds to ensure the system works efficiently to deliver quality and cost effective teaching programs.

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CHAPTER 2

Distance education and conceptual learning

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This chapter attempts to bring to bear on the business of teaching-at-a-distance some of the more significant recent research that has been done into how students learn. It asks why it is that many courses which try to help students to 'understand' or to grasp new concepts, or simply to 'think', all too often achieve disappointing results. As Ramsden (1988) states, only 'conceptual-change learning is high-quality education', yet many students seem to prefer to absorb knowledge or practise skills rather than properly understand the ideas and grasp the concepts which their course is attempting to communicate.

The problem is by no means confined to distance education; indeed much of the applicable research has been carried out in connection with face-to-face teaching. This chapter attempts to diagnose why 'conceptual-change learning' often does not take place in higher education and suggests ways in which the situation might be improved in distance as well as face-to-face teaching.

The word 'teaching' is used here to refer to 'the business of creating environments in which students can learn effectively'. It is therefore a much broader concept than simply 'imparting knowledge and skills' to students. And it involves being able to use effectively a wide variety of media and methods, including lecturing, videotapes, audiotapes, teaching texts, practical work, tutorials, computers, telephones, etc.

As far as distance teaching is concerned, the chapter assumes that the reader is familiar with most of the course design strategies commonly applied in the use of media and methods, including for example:

- in printed texts, the stating of aims and objectives; the use of signposting, redundancy, summaries and introductions, etc.;
- avoiding content overload;

- the use of self-assessment questions and other techniques designed to make learning as active as possible;
- the use of tutorials, self-help groups and assignments to improve interaction between students and between students and tutors;
- the use of other technologies and media to improve the communication between tutors and students and between students;
- the use of computers as teaching aids;
- the use of counselling to help students with learning difficulties of various kinds; and so on.

The problem is that despite all this educational structure, and despite the best intentions of teachers, the learning that results can still be more concerned with knowledge and skills than with conceptual development and understanding. The following analysis of why this is so applies particularly to courses in science and technology, but it is also relevant to courses in any subjects which are concerned with teaching new concepts as the basis for developing 'understanding' in students.

Distinguishing clearly between 'knowledge', 'skills' and 'understanding' in the cognitive domain, as implied by the above comments, leads to course design strategies which differ significantly from some of those that are in common use. The main differences arise from the premise that conceptual development requires much more effort than the teaching of knowledge and skills. That is, abstract concepts are much more difficult to grasp than is the memorising of information or the acquisition of skills; they need to be illuminated from a variety of directions, so that they can gradually take shape in students' minds and in due course become as 'real' and familiar as the everyday concepts we all use all the time.

The following are examples of design strategies that this approach entails.

Examples of course design strategies

Example 1. An awareness pack on microprocessors for managers

The need here was for a self-study pack to enable managers in manufacturing industry to appreciate the problems which arise when microprocessors are introduced into such products as washing machines, car ignition systems, slot machines, etc., or into their

production methods. The obvious design strategy for such a pack is to explain what changes are needed in production methods – linked to ample illustrative examples – from which managers would be expected to be able to extrapolate to their own situation.

However the course team felt that this would not be enough. Creating an 'awareness' of a complex process involves more than descriptions of it; it also involves some conceptual development, though at a fairly superficial level. It was appreciated that although managers would not need to be able to program microprocessors themselves, simply reading about the problems of using them, or even watching videotapes about them, would not dispel the mystique which tends to surround such complex devices. The course team felt that it was necessary for managers to understand something about microprocessors, if only so that they could communicate with their expert staff about them, and that therefore a richer educational environment than simply printed texts was needed.

It was decided therefore to include a small microprocessor home kit, with instructions on how to program it to carry out simple tasks, such as controlling (simulated) traffic lights or displaying ambient temperature in degrees Celsius, and also including some problems for the students to solve. Although these programming tasks were quite irrelevant to the tasks that managers would have to perform, they would nevertheless help to illuminate the nature of microprocessors.

The purpose of the kit and its accompanying handbook was essentially that of helping students to develop an understanding of microprocessors; not at all to do with developing skills.

Despite the absence of any tutorials, correspondence tuition, audiotape or videotape support, the pack was extremely successful. Surveys indicated that the 5,000 packs sold were studied by approaching 25,000 people.

Example 2. Aims and objectives

This example refers to many courses, rather than to a particular one, since it represents a strategy, based on the above analysis of the cognitive domain, concerning the use of 'aims' and 'objectives' in the structure of printed texts.

Based on this analysis, in courses where 'understanding' is one of the aims, a clear distinction is made between 'aims' and 'objectives'.

As usual, 'aims' are what the course *authors* aim to achieve, such as 'to explain electromagnetism'; and 'objectives' are concerned with what *students* should know or be able to do at the end of the course, such as 'state Faraday's Law of Electromagnetic Induction' or 'calculate the voltage generated in a coil which is rotating in uniform magnetic field'. This distinction between aims and objectives is familiar enough; indeed the conventional wisdom is that the objectives should be so chosen that when students are able to fulfil them the course aims will have been achieved.

However the above analysis of learning in the cognitive domain explains why, in some subjects at any rate, this is not true. In other words, it is not the case that doing well in tests of knowledge and skills amounts in the end to an understanding of the subject. The underlying concepts may not have been developed at all; the test questions may have been answered purely by the exercise of memory and well-practised skills. The 'aims' of such courses are therefore not thought of solely as the focus of the 'objectives', they are also a means of expressing the understanding which the students are expected to acquire.

With courses that are *not* explicitly concerned with teaching 'understanding', the aims may in fact be no more than the sum of the objectives. That is, the 'aim' may be to teach certain items of knowledge and skills, while the 'objectives' are that students should have learned these self-same items. This lack of distinction between aims and objectives is often a feature of courses in applicable mathematics, for example where understanding, knowing and doing seem often to coalesce. It is difficult to see, in some contexts, the difference between, say, 'understanding' integration, 'knowing how' to integrate and 'being able' to integrate. With such courses it is therefore quite legitimate to bring the 'aims and objectives' together under one heading. But in subjects like degree-level science and technology, where conceptual development is clearly different from the learning of knowledge and skills, they must be kept separate.

Example 3. An introduction to electronics
This course is now in its third presentation. It is particularly rich in abstract concepts since there is not much to see when one looks at an electronic circuit these days! So a great deal has to be done to enable students to perceive and understand what is happening in an amplifier or computer, and then to be able to use the explanatory concepts this understanding entails to design circuits to meet stated specifications.

In its first presentation the course was produced in the approved, so-called 'integrated' form in which topics were selected to be dealt with by different media according to their appropriateness to the medium concerned. Visual items were put on television and dovetailed in with vocal comment on radio, with practical work using the home kit and with analysis printed in the course books. Each medium was used to deal with a particular topic with little duplication or repetition. (Indeed, at that time some courses went so far as to ensure that there was as little overlap as possible so that students would have to study through each medium thoroughly if they were to receive the whole course.) This is now seen as inappropriate for conceptual development and the course design is now quite different. That is, factual knowledge is presented in the most appropriate way, as before, given the limited resources available to the course, and skills are similarly exercised appropriately, either in written exercises, in computer simulation, or with home kits for experimentation or simple projects, etc. Then the conceptually difficult aspects of the course are dealt with in a variety of ways, including using the media already used to teach the appropriate skills and knowledge, but also using other media and different methods (as explained later) so that the concepts forming in students' minds can be illuminated from various directions.

In practice, television is no longer used since its educational return does not justify the great expenditure of time and effort it demands. Time is precious on broadcast TV so there is a great temptation to keep explanations short. This may help to maintain the interest of casual viewers, but it makes serious learning very difficult. Much more effort is devoted to helping students understand simple conceptual models of circuit operation so that they can carry out 'back-of-envelope' calculations of circuit performance. They are provided with a sophisticated electronic home kit and must have access to a microcomputer for simulating the performance of circuits, so that they can compare their simple calculations with either the actual performance of the real circuits they build or with computer simulations of them, or with both. They can, of course, simulate far more circuits and try many more variants of design using the computer than they could possibly build using their home kit, or than could be shown and explained on videotape. The home kit, comprising an oscilloscope, signal generator, etc., and many integrated circuits and other components, together with the display unit of the computer, plus attendance at a one-week summer school, are intended to provide a sufficiently rich learning environment to support the required conceptual development.

The main difficulty with the kind of design strategy exemplified in the above examples is that of helping *teachers* to grasp the educational concepts which underpin it. Although 'knowledge', 'skills' and 'understanding' are widely-used terms, they do not have clear widely accepted meanings; so the first step in implementing the strategy is to decide on clear meanings for these terms, such as those suggested below, and ensure that teachers have understood them. But since 'knowledge', 'skills' and 'understanding' are themselves concepts, they cannot immediately be grasped sufficiently firmly for immediate use by teachers. A course for teachers on 'how students learn', dealing with these and other topics may well be needed before the design strategy can be implemented successfully.

Knowledge, skills and understanding

In science, terms like 'force', 'work', 'energy', etc., are given very different meanings from their everyday meanings. Phrases such as 'political forces' and 'going to work' are common in everyday discourse, but their meanings in such phrases are quite different from their scientific ones. But once the precise meanings of these concepts in science are clear, no confusion seems to arise.

The same approach is therefore applied here to the field of education. That is, the following explanations of the meanings of the terms 'knowledge', 'skills' and 'understanding' are not an attempt to change the meanings of widely-used terms; rather they are an attempt to establish precise meanings of them for use in the following discussions about education. It seems to be just as important in designing courses to be clear about the meanings of these key educational terms, as it is in engineering to be clear about the concepts of science.

Knowledge

Knowledge is information that has been memorised and that can be recalled in answer to a question. So the 'information' in books etc. only becomes 'knowledge' once it is well remembered. Knowledge is 'taught' by presenting information in the most appropriate form, by making it 'relevant' to help with student motivation (e.g. through problem-based learning), by teaching study skills and by frequent testing.

Some measure of prior understanding in the learner is of course needed: at least it is necessary for learners to comprehend the

meanings of the words used to express the knowledge. If students are interested and understand the meanings of the words and images to be remembered, their learning can be almost instantaneous.

Skills

Skills are here defined as 'the ability to do specific things almost without thinking, or without necessarily being able to understand the processes by which one does them'. Examples include many of our everyday activities such as speaking, writing, designing, doing elementary mathematics, playing tennis, etc. Although such acquired skills are clearly learned, they cannot be 'recalled' in the same sense that knowledge can be. Nor can they be learnt almost instantaneously no matter how interested one might be in acquiring the skills. That they have been learnt successfully can however often be tested quite easily by setting tasks that require the exercise of the particular skills.

Manual skills are not distinguished here from intellectual ones (as they are in Bloom's taxonomy) because their learning is no less a mental activity than learning intellectual skills, and they are learnt in much the same way. They are taught by instruction and demonstration, followed by the provision of plenty of opportunity for practice – with error correction. Since it is a great deal easier to *know how* to do things than to *be able to do them well* oneself, a good deal of self-monitoring of skills is possible.

Understanding

Understanding involves 'grasping concepts and being able to use them creatively' in such activities as explaining new phenomena, designing and producing new products, diagnosing causes of failure, tackling new projects sensibly and successfully, asking searching questions, making good decisions based on incomplete data and knowledge, and so on. There are many levels or degrees of understanding. At its most advanced level understanding involves grasping abstract academic concepts, the meanings of which cannot simply be taught by pointing to instances and counter-instances, as can everyday concepts. In engineering, for example, such concepts as energy, magnetic fields, centrifugal forces, quality, productivity, cannot be ostensively defined in any clear way. Similar advanced concepts form a part of all branches of higher education.

As already indicated, it seems that to help students grasp new concepts it is important to create a 'rich learning environment'. For small children who are learning the meanings of everyday concepts, guided exploration in a rich everyday environment is important. The key concepts in academic subjects, however, are not usually so easily made apparent by simple individual exploration; their 'discovery' or creation in science, for example, was the work of geniuses. Indeed advanced concepts cannot usually be fully grasped even by having them defined or explained. They cannot be memorised like knowledge or acquired by practice like skills; they have to be exercised, discussed, applied, read about, written about, asked about, used in designs and explanations and so on, if they are to be fully internalised. Hence the need for a rich educational environment.

To test for understanding it is necessary to set students new challenges and see how they tackle them, as explained shortly.

The importance of the concept 'understanding' was thrown into sharp relief by the research of Marton and Säljö (1976) with their distinction between the 'surface' and 'deep approaches' to learning. The 'deep' approach is identified as 'the intention to understand and to look for meaning' and contrasts with the 'surface' approach which is simply 'to memorise information and practise skills without question'.

Here, for the moment however, we are primarily concerned with identifying the *actual* kind of learning that results, rather than the approach to learning that students adopt. But the adjectives 'surface' and 'deep' can similarly be applied to the learning that occurs. That is, 'surface learning' can be thought of as comprising only knowledge and skills, whereas 'deep learning' is synonymous with understanding and conceptual development.

Methods, such as problem-based learning, of encouraging the deep *approach* to learning are now well understood, and the evidence indicates that it is better than the surface approach even for improving the long-term recall of information, possibly because it is normally more motivating. The deep *approach* to learning is, however, almost certainly essential for deep *learning*, as illustrated in later sections.

In general it is to be expected that if students find it too difficult or time consuming to adopt the deep approach, with the result that the concepts which underpin the required levels of understanding do not readily form in their minds, they will fall back on the surface approach

and hope for the best in exams. At present, with the teaching styles commonly adopted, with the typically over-full curriculum and traditional forms of assessment, there are neither incentives nor opportunities for the majority of students to adopt the deep approach.

It should be noted that a form of understanding can be acquired in some fields through 'experiential learning'. Apprenticeship, or working 'on the job' alongside an expert, often enables one to solve new problems by a kind of extrapolation from previous experience, rather than by the application of explanatory or analytical concepts. This kind of expertise is sometimes loosely referred to as 'understanding', even though it is rarely possible for experts who have learned this way to be explicit about how they solve problems. Know-how is probably a better term for it.

Computer-based expert systems attempt to encapsulate this know-how so that other people can apply it or acquire it. But it is not the same as understanding based on conceptual development, which enables people to 'think out' solutions to problems rather than extrapolate from previous experience. Students don't spend long enough in educational establishments to engage in experiential learning in more than a few areas, so teachers in higher education need to learn to teach conceptual development too.

It is interesting that 'understanding' was not separated out as a distinct concept in previous taxonomies of educational objectives (e.g. Bloom, 1956; Gagné and Briggs, 1979; and others) although it has been implicit in most of the 'high-level skills' listed in these taxonomies. This is presumably because it is not easy to assess understanding in behavioural terms. Only students' 'inputs' and 'outputs' can be observed, so their thoughts have to be inferred. Their levels of understanding are revealed when their responses to questions are of a kind which could not have been achieved by recall or well-practised skills. Understanding provides the platform from which it is possible to 'go beyond the information given' (to use Bruner's phrase, 1974); so it is the basis of successful behaviour in new and unexpected situations. In other words it is the basis of 'thinking'.

Behaviourism ignores the concept of understanding precisely because it is not apparent from human behaviour on specified and practised tasks. But it is a key factor in the sensible and successful meeting of new challenges of all kinds, especially in fields like

technology where the creation of new designs to meet new problems is an everyday activity.

Assessment methods

Assessment methods are a dominant influence on the kind of learning that takes place in higher education. Although the intention of most teachers in higher education is to test students' understanding and their ability to 'think' problems through, the reality is often rather different. Even when students are set questions in the conventional three hour examinations which they are supposed to answer on the basis of understanding, they often find that they can more easily obtain high marks by memorising the required knowledge and practising the required skills (Prosser, 1987; Ramsden, 1986; Ramsden, Beswick and Bowden, 1987). Indeed the students who have properly understood the principles involved, and who try to think problems through, may find themselves at a disadvantage in the limited time allowed in an exam.

There seem to be good reasons therefore to test for understanding using quite different kinds of challenges from those used to test students' knowledge and skills. Indeed one of the important conclusions of this analysis is that the three kinds of learning in the cognitive domain should not be assessed together in a single examination.

As pointed out in Example 2, the knowledge and skills expected of students can usually be identified quite easily and specified as performance 'objectives', and the assessment used can take any form which is capable of assessing students' performance against these objectives. Multiple-choice questions can efficiently test certain kinds of knowledge; and tasks which do no more than test skills, such as numeracy, literacy, communication, even interpersonal skills, can generally be devised without too much difficulty.

Testing for understanding is however more difficult because, as already pointed out, the level of understanding cannot with certainty be inferred from a student's performance. As soon as the understanding required of students is translated into *specific* objectives, the 'correct' answers can be learned by heart and practised. The time limitations of examinations impose such severe constraints on the kinds of questions that can be asked that extrapolation from previous model answers is often very successful. Hence the kinds of challenges to be set should, at

least to some extent, be new to the students. No doubt this is why, in many countries (e.g. Italy and Sweden), oral examinations are thought to be so important, despite the strain they impose on students.

With distance teaching the possibilities for oral exams are limited, so there is a great need for examinations based on the kinds of activities listed earlier which depend more on understanding. Projects are already widely used and can usually be designed to be valid tests of understanding, but they are very time consuming. They inevitably focus on quite small and specialised problems. 'Student-centred learning', when it means requiring students to set the criteria by which their projects are to be judged and then requiring them to assess their own projects, can be particularly challenging (Boyd and Cowan, 1985).

But there is also a need in distance education for formal examinations which set the same kind of challenges that projects can set. The first step is certainly to separate the assessment of conceptual learning from the assessment of knowledge and skills. The kinds of questions which demand understanding more than knowledge and skills include, for example:

- asking students to correct errors in texts or calculations – and to give explanations;
- requiring students to explain how they *would* tackle problems – without actually asking them to do so. This allows much more complex problems to be discussed than when specific calculations or topics have actually to be dealt with, specific calculations can still be tested in another exam.);
- requiring students to set questions themselves and to explain why they think they would be challenging;
- requiring students to explain how they would mark a given question and answer.

At all events, evidence suggests that if understanding is not assessed in specifically designed ways, those students (which is most of them) who want to obtain high marks will continue to treat examinations as tests of their knowledge and skills, rather than of their understanding, and teaching methods aimed at encouraging the deep *approach* to learning will still only result in surface learning.

Individual learning styles

Students differ individually in the way they learn, at least where conceptual learning is concerned, and these differences need to be taken into account in course design. There is little difference between students in the ways they prefer to learn knowledge and skills, since the techniques that are effective depend more strongly on what has to be learned than on individual preferences. Committing information to memory and practising skills are straightforward activities, even if they may be difficult or tiresome. But where deep learning is concerned, students seem to fit concepts into their 'world models' in various different ways.

Some students are primarily 'verbalisers' and find it preferable to hear or read about concepts and discuss them; others may be 'visualisers' or 'doers' and may need visual information or practical activities to support their learning. This implies that the multimedia methods often adopted in distance teaching should not so much match the medium to the particular *topics* in a course – and so produce a 'properly integrated' whole – as provide alternative teaching media and methods, where possible to cater for the students' different preferred learning styles. Teaching the particularly difficult concepts through visual media and practical projects as well as verbally may be a better strategy than allocating each concept to only one particular medium. Without this kind of redundancy in multimedia teaching of conceptually difficult material, surveys of student opinion about the way a subject has been taught may indicate more about the kinds of students in the selected cohort than about the quality of the teaching!

Similarly, the differences between 'holist' and 'serialist' learners have been identified (Daniel, 1976; Pask, 1976). These differences can be catered for, by structuring conceptual material so that it is appropriate for holist learners as well as for serialist ones. Printed texts, for example, are usually serialist in character so they need to be overlaid with summaries, signposts, introductions, repetitions, redundancies, etc. so that holist learners can easily find their own way through them. On the other hand, projects – especially design projects – are naturally holist in character so guidance as to their conduct needs to be added to help serialist students along. Pask's research showed that students' learning effectiveness could be approximately doubled by matching the teaching style to their learning style.

Learning how to learn

Gibbs (1981) and others have pointed out that it is important that students 'learn how to learn'. Many books have been published on study skills of one kind or another (e.g. Buzan, 1974) but these are mainly concerned with support skills, such as note-taking techniques, ways of organising one's time or methods of improving one's ability to memorise – all of which are important but are more to do with surface learning than with deep learning.

A course on *Learning to Learn* for students would be concerned with a number of additional matters, in particular:

- helping students to discover their own preferred learning styles – whether they are holist or serialist learners, whether they prefer verbal, visual or practical forms of communication; and
- helping students to distinguish between the different kinds of learning expected of them – in particular the difference between knowledge, skills and understanding and how they are taught and learnt. Being able to distinguish between surface and deep learning, and between experiential learning and learning through education is also important.

Downs and Perry (1982) have shown that students have little difficulty in grasping some of these ideas, and that the consequence of their doing so is a significant improvement in learning effectiveness. Just to learn the difference between 'memorising a fact and grasping a concept' often marks a big improvement in students' learning abilities. In other words the matters discussed in this chapter are important not only to teachers but also to their students, if improvements in conceptual learning are to be brought about.

Teaching methods

Introduction

Deep and surface approaches

The deep approach to learning is effective in bringing about conceptual development because it ensures that students become involved with the key concepts in their subject. The concepts come to be discussed, exercised, applied, read about, written about, asked about, used in designs and explanations and in error correction exercises, etc., all of which help with their internalisation. 'Problem-

based learning' is an example of a teaching method which has been shown to be very effective at encouraging many of these activities (Boud and Feletti, 1991) and it is relatively easy in face-to-face teaching to provide facilities for students to do these things – although it is not always done. In distance teaching however some of these learning activities are not so easy to arrange, so every opportunity to do so needs to be exploited to the full.

Multimedia

The multimedia approach often adopted in distance teaching can also be effective. The concepts forming in students' minds can be illuminated from a variety of directions by the different media used. However it is all too easy for students to adopt a surface approach and for multimedia methods to emphasise only knowledge and skills. So effective teaching methods, as well as a good choice of media, are both important aspects of bringing about conceptual learning. The following are examples of teaching methods which emphasise conceptual learning.

Some practical examples:

Projects

It is possible to run projects at a distance and, provided they are challenging enough and are not merely concerned with information gathering or with straightforward exercises, they can be very effective in the narrow field on which they are focused. Projects do not, however, ensure that conceptual development takes place across a whole subject area, so are rarely sufficient on their own.

Printed texts

The various well-tried methods of structuring printed texts referred to in the introduction to this chapter are helpful not only in making learning from them more active, but also in improving the text's accessibility to 'holist' as well as 'serialist' students. However it is always possible for students to be purely passive readers of printed text, so any attempts to induce a more active form of learning requires the students' cooperation if they are to be effective.

Some students study simply for the pleasure and interest of doing so and are therefore unlikely to take short cuts; but for students who are primarily interested in high marks and a good qualification it is essential

that they believe that conceptual learning, rather than just 'knowing and doing', will really be needed when it comes to the final assessment of their learning. An introductory module explaining the difference between surface and deep learning and between knowledge, skills and understanding and how they will be assessed may well be needed too.

A further strategy to improve motivation, as well as to help holist learners, is to indicate directly the relevance and purpose of the teaching materials being presented. Aims and objectives do this too, but in a very academic way. A better sense of direction can be given by describing a specific real problem, or the kinds of problems which the materials will help to solve, so that students can fit the new ideas being presented to them into a coherent pattern for themselves. In other words a whole module of printed material can be structured as an exercise in problem-based learning.

Small group tutorials (face-to-face)

Face-to-face meetings between a tutor and a small group of students, or simply between self-help groups of students, are likely to be infrequent in distance teaching, but because they can be so effective in the development of deep learning they must be well used. Abercrombie (1979) distinguishes between three kinds of small group working:

- they may be remedial in nature, concentrating on students' questions and correcting their errors or misconceptions;
- they may be strongly tutor-directed, as in a school classroom, with the tutors instructing and explaining and helping students who get stuck on the tasks they set;
- they may become a kind of forum in which students can express and compare their own understandings of the problems presented to them.

In practice it is common for tutorials to be strongly tutor-led unless deliberate steps are taken to ensure that students actively participate. Research by Murgatroyd (1980) on Open University tutorials in the early days showed that students rarely spoke for more than 10 per cent of the time, and usually for a good deal less! Recordings elsewhere (e.g. of telephone tutorials in Australia) reveal similar statistics, implying that the tutorials were in practice used mainly for remedial purposes. This is good for surface learning but rather limited in its effectiveness in conceptual development.

For conceptual development it is important to ensure that students actively participate, not by asking questions for the tutor to answer, but by expressing their own views and explanations. As any teacher knows from experience, explaining difficult ideas is a severe challenge to one's own understanding of them, so it is usually better for students to try to talk about what they believe they *do* understand, than for them to listen to the tutor explaining yet again the latest thing that they *don't* understand! While it may be better when developing knowledge or skills for tutors to set problems and to correct students' mistakes, it is usually better, when lack of understanding is the problem, for tutors to help students sort out their own misunderstandings rather than to try to sort them out for them.

Stimulating students to participate in an educationally rewarding way is not very easy in the sciences and engineering. This is mainly because the aim is to help students to master *accepted* principles and apply them (so it is easy to be 'wrong'), rather than to help them formulate a well-thought-out personal viewpoint, as is the case in a number of other subjects (where disagreements are more common than mistakes).

But there are now a number of effective and well-tried methods which can be used even in science and engineering. They generally depend on providing an immediate, challenging, common experience for students to concentrate their thoughts on. Such techniques include:

- 'Tutored Video Instruction' (TVI) pioneered by Gibbons *et al.* (1977) at Stanford University, in which small groups view and discuss videotapes of lectures in short sections. The tutor's role is to facilitate discussion rather than provide explanations;
- problem-based learning, including (a) presenting (engineering) students with a faulty machine, or a poor design, or a failed product of any kind, for discussion as to the causes of failure; or (b) setting problem-solving exercises which include time set aside for *students to explain to each other*, in pairs, how they have tackled the problems they have been set.;
- 'peer tutoring' in which local, more-advanced students act as tutors. Students often feel freer to express themselves in such tutorials, and they often benefit the 'student-tutors' as much as the students being tutored (Whitman, 1988).

The more conventional methods of, for example, requiring prior reading to be done, are less effective because the reading is not immediate and varies greatly between students.

So, although in remedial tutorials and tutor-led tutorials the tutor should be an expert in the subject in question, for group working in which student participation is emphasised, the tutor has to be a facilitator. There are positive advantages to be gained if the tutors do not know all the answers (or appear not to), provided they are good at stimulating serious discussion. (At Stanford they have been known to replace tutors who know too much!)

Small group tutorials (at a distance)

Face-to-face tutorials are infrequent in distance teaching, but modern technology is now capable of providing 'remote tutorials' to which the same teaching principles apply. Audiotelephone conferencing has been used very successfully in Wisconsin USA for 25 years and attracts tens of thousands of students every year to its courses.

Computer-conferencing (Hiltz and Shapiro, 1990; Mason and Kaye, 1989) is developing rapidly in a number of distance teaching universities and colleges, as well as in face-to-face ones! Indeed, computer conferencing can be less daunting not only for shy students, but also for students who don't think very rapidly during discussion about new subjects and who have difficulty expressing themselves orally. Since the 'computer conversations' do not take place in real time, students can prepare their comments and questions at their own pace before entering them on the 'bulletin board' for others to read. So for some students computer-mediated communication has some important advantages over face-to-face tutorials.

Practical work

Practical activities, either in a laboratory or at home using practical home kits sent as part of a distance-teaching course, can be used for a variety of educational purposes. For example:

- to exercise practical skills;
- to enable students to confirm and reinforce the theories presented in other ways;
- to give them the opportunity to 'discover' facts or laws of behaviour;
- to help them to design experiments;
- to enable them to tackle projects, especially design projects;
- to help them grasp difficult concepts;
- to provide worthwhile topics for individual report-writing.

The actual purpose/s to be chosen depends on the educational aims of the course of which the practical work forms a part.

If practical work is to be used to develop understanding, the kinds of experiments which, like many scientific ones, require students to follow instructions, obtain data, plot curves and draw conclusions in well specified ways, are not challenging enough.

In fields such as engineering, practical activities have to be more than experiments; they need to include a mini-project, or an open-ended problem-solving task, too, so that the principles demonstrated in the activity have to be applied immediately in a challenging way. In general, students' own solutions to such mini-projects are more worth writing about. For other purposes, of course, practical activities should be designed differently.

Computer marked assignments

Computer marked assignments are usually thought to have little to do with deep learning, their main function being a simple and efficient way of testing students' knowledge and skills. But the CADE system developed in Sweden (Bååth, 1977) has shown how computer-marked assignments can also contribute to conceptual learning. In this system the computer-generated responses to students' answers to multiple choice or true-false questions are neither the correct answers nor the marks gained. Instead they are encouraging, computer-generated letters suggesting in a general way (i.e. not specific to the kind of mistakes made) how the students might correct their own errors through further study. It is possible in this way to persuade students to think further about the problems set and so correct their own misunderstandings.

Computer simulation

Free-standing micro-computers in the home or at a place of work can nowadays be used in a variety of ways for educational purposes. They have for some time now been used for such activities as 'drill-and-practice' to help teach certain skills, as 'number crunchers' for complex calculations, as wordprocessors, as databases to support design activities, and for computer-aided instruction. But these uses only indirectly assist with conceptual development; they do not usually provide the kind of challenge that deep learning requires.

Simulation, especially in engineering, can however provide a sufficiently rich form of interchange between student and computer to promote conceptual learning. Simulation programs enable students to try out different designs or solutions to problems – the computer doing the analysis of each proposed solution. If students just explore all the possibilities by trial-and-error in the hope of arriving at a good design, their understanding is unlikely to be much improved. But if they accept the challenge of trying to arrive rapidly at good solutions through the intelligent use of the new concepts they are trying to internalise, their understanding can be significantly advanced. Marks related to the number of simulation trials can encourage a thoughtful approach to the design tasks.

Distinctions between the optimum use of most other media and teaching methods can similarly be drawn. But as remarked earlier, attempts to encourage conceptual change through the use of imaginative teaching methods can easily be undermined if the assessment methods used do not also specifically assess understanding and conceptual development.

TV and tape recordings

Well-made, broadcast, educational TV programs are good for publicity. They are also excellent for providing information and demonstrating skills because they can show actions and places that cannot be seen in any other way. Videotapes are even better for this purpose because they can be stopped and replayed allowing time for students to think and take notes. But for conceptual development both TV and videotapes suffer from the simple fact that concepts cannot be photographed. Provided conceptual teaching has preceded them, video programs can put concepts in context, explain them or illustrate them by analogy and animation and show how to solve problems using them, but the spoken word has to be allowed to dominate. Furthermore, since most people have developed the habit of passive TV viewing it is difficult to encourage active learning. Audio-vision (i.e. audiotapes linked to printed diagrams, pictures, tables, poems, etc.) is often a better system for conceptual development because there is naturally a better balance between words and visuals.

Conclusion

Any complex activity can be analysed in a variety of ways depending on the purpose of the analysis and education is no

exception – hence the variety of educational taxonomies that have been proposed. The simple three element taxonomy of the cognitive domain used in this chapter is valuable because it maps very accurately onto the three fundamental aspects of the educational process, namely: the different ways students learn, the different teaching styles teachers can adopt and the different appropriate methods of assessing student learning. Previous more complex taxonomies have been more concerned with methods of measuring student performance at different levels of knowledge and skills; they have not separated out understanding as a distinct concept and were not clearly related to teaching methods or to learning methods.

From the analysis it is evident that a good deal can be done, even in distance teaching, to help students concentrate their efforts more on grasping the concepts than simply learning things by heart and acquiring useful skills.

This chapter has attempted to show that there are some fairly clear pathways to be found through the maze of the teaching of complex issues. Research has shown that it is not wholly uncharted territory. The kinds of resources, teaching processes and assessment methods which are appropriate to each of the categories of learning in this taxonomy are summarised in Table 1.

This table also refers to learning in the 'affective' domain which, despite its great importance, particularly as regards motivation, has not been discussed in this chapter for reasons of space. Suffice to say that attitudes and motivation are essential aspects of effective learning as any teacher knows, and that *paying due attention to them is an essential aspect of all teaching in the cognitive domain.*

Finally, it must not be forgotten that most real-world problems are holist in character, and therefore need a mixture of knowledge, skills, values and understanding or experience for their solution. Problem-based learning, as well as the examination of case studies, are valuable teaching methods not only because they encourage the deep approach to learning and usually provide the kind of motivation which rapid learning needs, but also because they show that there is still some way to go before the analysis of teaching and learning is complete and the territory is fully charted. Nevertheless, the analysis of learning into the four different domains shown in Table 1 indicates some essential steps that need to be taken along the way towards helping students develop an effective problem-solving capability.

TABLE 1
An analysis of the teaching/learning process

Teaching / Learning	Resources	Process	Assessment of outcome
Knowledge (surface learning)	Provide information in best way (lectures, databases, video or audiotapes, books, etc.).	Show relevance of information to experience. Teach simple study skills. Use discovery methods appropriately.	Test for recall by questioning.
Skills (surface learning)	Provide facilities appropriate to the skills being learnt. (labs, problem classes, computers, group projects, etc.).	Instruct and demonstrate the skill and make opportunities for practice—often, but not necessarily, supervised.	Set tasks that require the exercise of the skills.
Understanding (essential to deep learning)	Provide a rich educational environment (lectures, labs, computers, library, tutorials, coffee bar, VCRs, problem classes, electronic mail, etc). Further education for staff.	Focus teaching on concepts. Encourage students to use many facilities to help them grasp new concepts. Set projects. Add problem-solving to all lab experiments.	Set new tasks that require understanding, not just skills and memory for their completion (eg projects, open-ended questions, correct-explaining, etc.).
Attitudes values and personal qualities (the affective domain)	Provide congenial surroundings, good quality teaching, counselling, outlets for personal projects newspapers, discussions, etc.	Motivate where necessary (in lectures, visits, etc). Teach Learning to Learn. Set challenges that can be met.	Personal contact, the effort exerted, the attitude to challenges, the questions asked.

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Section 2

The educational developer in action

CHAPTER 3

Swapping hats in the mud: instructional designer turns subject specialist

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When the British entertainers Michael Flanders and Donald Swan enthralled their audiences in the late 1950s, little did they know that their song 'Hippopotamus' would provide a suitable entrée to an exposition on instructional design. The refrain went like this:

Mud, mud, glorious mud,
Nothing quite like it for cooling the blood.
Then, follow me! Follow! Down to the hollow!
And there *we* will wallow in glorious mud!

'*We*', of course, is a reference to an instructional designer and subject specialist duo wallowing in glorious instructional development mud, and by merely changing the word 'cooling' to 'heating' the refrain has direct application! Some years after Flanders and Swan began performing their ditty, Reigeluth (1983), who was well aware of the existence of the mud pool, was to conclude (p. 473) that 'There is a great need for a knowledge base to guide instructional developers and instructors ... but this promising discipline is still far from being able to prescribe optimal methods for all goals and conditions.' He went on to ask the question, 'Given the situation, what is needed now?'. In other words, how do we emerge from the mud?

This chapter does not pretend to answer that question. Nevertheless as an instructional designer I have had the opportunity to swap hats and work as a subject specialist in writing a distance education study guide. As a result, I have wallowed in that hippopotami mud and can relate something of the experience, hopefully making a small contribution to 'emergence'.

By a curious set of circumstances my background both in law and distance education became known to a professional organisation which was developing a Diploma of Financial Planning. This was

to become the primary means by which new members of the association could be accredited as financial planners. The organisation's American counterpart included estate planning in its financial planning curriculum, so it seemed prudent for this topic be developed as part of an Australian course. I was invited to develop a curriculum for Australian conditions and to write an introduction to estate planning (about 10 hours of study) as well as a full subject (one of two in a semester) on estate planning.

So the challenge was to swap hats – to change from instructional designer to curriculum designer and subject specialist – and develop a curriculum and transform it into study guides.

Estate Planning: curriculum and instructional design

The first hurdle to writing on estate planning was not long in coming. In Australia it had traditionally been a means of minimising the incidence of Federal Estate Duty and Probate or Succession Duty through gifting programs. Gifts were spaced in such a way as to minimise or avoid the imposition of gift duties while at the same time reducing the capital base, thereby also reducing the incidence of death duty when death duly arrived. When death and gift duties were abolished, estate planning as we had come to know it virtually ceased. What might the subject 'Estate Planning' include? Although there was no curriculum, I was provided with a list of suggested topics and given a free hand in development. The list was helpful but there was no rationale for inclusion or exclusion of topics. I sought to establish suitable criteria and eventually determined that topics would be included on the basis of their relevance to the financial planner, provided there was some direct or indirect link with death. Taxation Planning was already a subject in the course so it was important to avoid duplication. I decided to stand in the shoes of a financial planner and consider what kind of clients or business experiences might be encountered by such a person. This would help me to decide what was relevant. So I began to compile my list of topics.

Topics

Planning for death clearly includes will making so while that was an automatic choice, the approach to be taken was not. The books available either describe the law of wills or contain precedents to be used by solicitors in will drafting. Unlike a solicitor, the financial planner does not prepare a will but rather urges a client to make or

review his or her will, so teaching the law about wills or how to prepare one would be an inappropriate approach. I speculated that what was most relevant was to enable financial planners to identify the issues which solicitors would focus upon when taking instructions as to who was to receive the client's bounty upon death. These issues can be categorised according to the life-situation of the client, that is, whether a recently married person, a separated person, a divorcee, an elderly person without children, a farmer, a parent with a spendthrift child and so forth. I compiled the study materials on wills with this approach in mind.

Testators' family maintenance sprang to mind, since it may be that inadequate provision has been made for a dependent and a financial planner may need to know that a court can remake the will of a person in such circumstances. A financial planner may also wish to advise a client to sign an enduring power of attorney appointing a family member as his or her attorney during a holiday overseas, or in anticipation of forthcoming incapacity. Having someone conduct one's affairs during the twilight years is at least faintly connected with planning for death. Family Law, including consideration of divorce, separation and de facto relationships, also came under consideration. Should I include details of how coroners work? What about funeral practices in the community? They may not be directly relevant to financial planning, but could be worthwhile background for advisers, helping them to forge a relationship and understanding with their clients.

Then I thought of a series of topics relevant to the post death situation. Who might be authorised to collect assets and how did they get their authority? So grants of representation were clearly relevant, as were the duties of an executor or administrator in relation to collection of assets and the rights of beneficiaries to ensure an estate is properly administered. Capital gains tax in relation to deceased estates would clearly be of interest, as would aspects of approved deposit funds and superannuation funds associated with the death of a depositor or contributor.

What finally became included in the course and how it was developed is not of particular interest here, but the design issue is. Here I was, operating as designer turned author, discovering that the key issue was that of relevance to the student. As I wrote I found myself continually making judgments about what my students would study on the basis of what might be relevant to them in planning for death or administering an estate after death.

Subject structure

Estate Planning was the last of eight course subjects so the structure of the study materials had been determined well before I began writing. It was important that the course be self sufficient as there was no budget for tutorials or student support services. Nor could there be assignments, so progressive checking of learning by the use of intext questions was of great significance. I needed to be continuously on the lookout for opportunities to progressively test learning. In addition, each topic contained at least five review questions which required suggested answers.

The structure comprised an introduction to the topic, a list of educational objectives and details of pertinent teaching materials – generally readings supplied at the end. Then came the descriptive study guide incorporating a series of intext questions, a review or summary, plus review questions and answers, and suggested answers to the intext questions. The topic generally concluded with a reference list.

Intext questions

As I was writing the teaching materials and looking desperately for intext questions, I could not but help reflect on some of Lockwood's work, for example Lockwood (1991). Although they may help set the parameters of the course, it was doubtful whether students would in fact do the self help questions. And if they did, it may not be in the intended order. Was I providing a useful learning environment? Was the learning path clear and unambiguous? Was learning being progressed through intext questions which reinforced or expanded concept learning, or was I really playing the intext question game by merely including those questions because that was the expectation of the system?

Well, I guess I tried. But I must say that I found it very difficult to generate intext and review questions in sufficient quantities while writing the study guide. It felt like I needed to focus exclusively on the writing task and defer generation of intext questions until I could reflect on where I was at and then develop questions which I thought would be of most use. This was contrary to expectation as I believe that most instructional designers would advise their authors to plan intext questions soon after writing educational objectives as part of concept development, but postpone writing them until they came to the relevant part of the study materials. I now wonder how

realistic this procedure is since an author's perceptions of key concepts may change during the writing process and intext questions would then require corresponding adjustment.

Learner outcomes: exit knowledge, skills and values and attitudes

Skills

A useful technique for instructional designers working with content specialists is to prepare a matrix which plots the topics within a subject against the knowledge, skills and values and attitudes which it seeks to teach. This can be useful in identifying gaps and ensuring that writers appropriately address each of these three areas. It is not at all uncommon for an instructional designer to receive a draft which is exclusively knowledge based, crisply identifying knowledge outcomes for students but failing to consider either skills on the one hand, or values and attitudes on the other.

I cannot pretend to have developed such a matrix for Estate Planning, but awareness of the work of Bloom *et al.* (1971) and Romiszowski (unpublished paper) did sensitise me to these issues. I have already referred to the knowledge domain in discussing the development of topics, but what skills did I want my students to acquire? What values and attitudes did I want to convey? In so far as skills are concerned, it was certainly not my task to turn financial planners into solicitors, so on reflection I decided that my objective was to help students develop enough skills to identify key issues and be able to work with the client and other professionals in achieving a desired outcome for the client. To do this I considered that financial planners needed to develop a pen-picture of how the legal system works, as well as the way in which a solicitor works. In addition they needed to be able to identify other professionals such as accountants and bank managers who could provide expert advice in given areas. These general skills were continually in the background during the writing process. Wherever relevant, they were introduced.

Values and attitudes

Financial planners would consider themselves to be members of a profession. They have a regulated association of members, entry to which is based on accreditation, an identifiable body of knowledge and a code of professional conduct. A consequent value is that the interests of the client must be paramount, transcending personal

interest. Empathy with the client is desirable, coupled with an evident willingness to clarify the client's goals, ensure that they are achievable and pursue them vigorously. Preparedness to work with other professionals in solving client problems is another desirable attitude. The financial planner also needs to recognise that he or she is involved in running a business for profit, so it therefore needs to be run efficiently. Risk taking should be minimised, thus protecting the business against possible adverse legal action.

Wherever possible these kinds of values and attitudes were incorporated into the study materials. In swapping hats from instructional designer to author I found the educational technique of addressing exit knowledge, skills and values and attitudes a useful and practicable arrangement.

The writing experience – from mud to masterpiece?

Writing a large volume of material was a new experience. I had previously written essays, assignments and an article or two, and in some cases had them typed up, but now I needed to approach a mammoth task and do so in an organised way. In the preceding year or two I had developed some basic computer literacy, so I decided to get my material onto disk from the outset. I had seen a computer program described as an ideas processor (as opposed to a wordprocessor) which claimed to facilitate outlining, so decided to use it.

Ideas processing – outlining

Whereas word processing is lineal, that is it begins at the beginning, ends at the end and then stops, ideas processing is hierarchical, that is working with headings, sub-headings and so forth (i.e. outlines). Some comparisons may be useful (see Table 1).

Word processing	**Ideas processing**
1. Word processing is lineal.	1. Ideas processing is hierarchical
2. It can be difficult to find the spot where you want to insert a new idea—either much scrolling of the text, or nowhere effectively to put the idea because you are not yet up to it in the document.	2. Major headings in the hierarchy will almost always fit on the screen without the need to scroll headings to determine the whereabouts of the section you are trying to locate. Any part can be readily accessed whenever desired because of ease of entry to all parts of the document. When an idea occurs it can be easily entered under the relevant heading and refined later.
3. A word processor focuses on mechanical issues such as text entry, syntax, spelling, punctuation and appearance.	3. An ideas processor supports the creation, design and organisation of thoughts and the conceptual, structural and semantic issues that determine content, flow, style and meaning. It does so because its hierarchical structure facilitates association of ideas.

Table 1

Comparison between word processing and ideas processing

Other comparisons could be made but these will suffice to convey why I was interested in trying ideas processing or outlining as a means of developing a study guide in an organised way. I used it not only to develop the initial list of topics previously described, but also to develop the list into a study guide. I tested out the claim that an ideas processor really was just that!

I began with the list of topics which established the parameters of course content. I then elaborated each topic heading into sub-headings, sub-sub-headings and so forth. It worked! When ideas occurred they were speedily placed at a relevant point in the outline. If an idea proved to be inappropriately placed, it was readily moved to a different point in the hierarchy. Ideas about knowledge base, skills and values and attitudes were inserted as they came to mind, or upon reviewing the emerging outline. Suitable references were recorded in relation to the relevant topic. Items were pruned, elaborated and shunted around until eventually it began to take shape. Text windows were added and the descriptive part of the study guide inserted. I started with the material with which I had greatest familiarity and progressed to more difficult areas.

An idea of what was happening can be gleaned from Figures 1 and 2. The first eight topics listed in Figure 1 were elaborated in the manner shown in Figure 2.

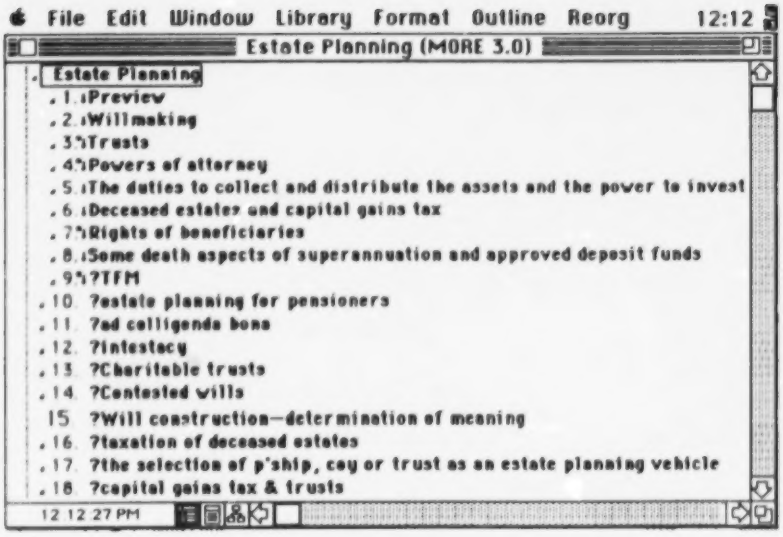
File Edit Window Library Format Outline Reorg 12:12
Estate Planning (MORE 3.0)
Estate Planning
. 1. ↓Preview
. 2. ↓Willmaking
. 3. ↓Trusts
. 4. ↓Powers of attorney
. 5. ↓The duties to collect and distribute the assets and the power to invest
. 6. ↓Deceased estates and capital gains tax
. 7. ↓Rights of beneficiaries
. 8. ↓Some death aspects of superannuation and approved deposit funds
. 9. ↓?TFM
. 10. ?estate planning for pensioners
. 11. ?ad colligenda bona
. 12. ?intestacy
. 13. ?Charitable trusts
. 14. ?Contested wills
15 ?Will construction—determination of meaning
. 16. ?taxation of deceased estates
. 17. ?the selection of p'ship, coy or trust as an estate planning vehicle
. 18. ?capital gains tax & trusts
12 12 27 PM

Figure 1
Topics – those with question marks were excluded

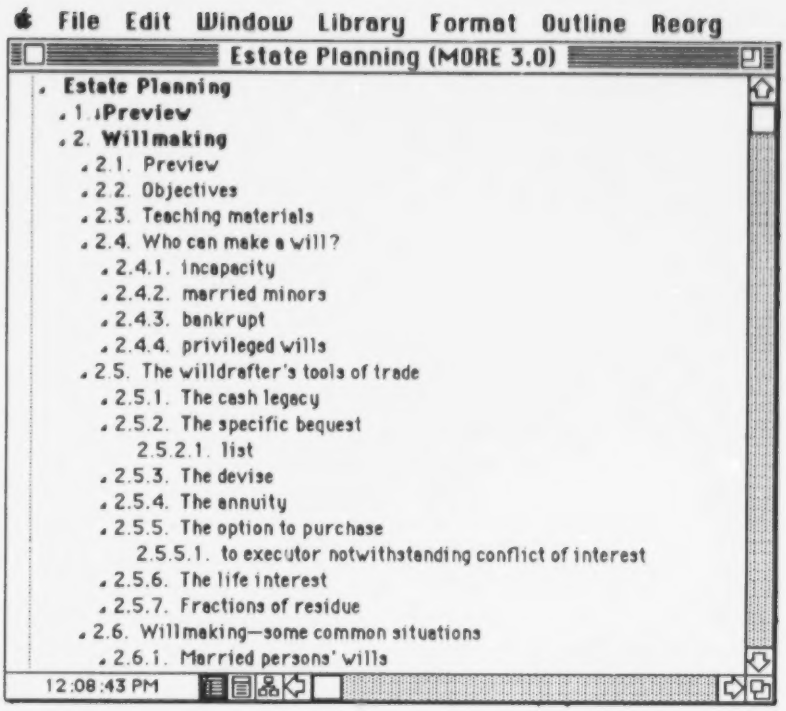

Figure 2
The topic of will making as outlined

And then I remembered! Study guides are supposed to have educational objectives! By this stage I had a reasonably well developed notion of the direction in which I wanted my students to go and the outcomes that I wanted for them. So I paused and began to write draft educational objectives. I then put them aside for a later day, but they did help me to focus more clearly on where I was going. Strictly speaking these educational objectives should have been developed at the outset, so as an instructional designer I had left my run too late. However as an author, I had at least elaborated my preliminary ideas and was now using educational objectives as a means of refining them. This was a valid experience and I certainly did not stick to my preliminary objectives. This confirmed my previous bias towards viewing educational objectives as a helpful working tool for an author, rather than a vital teaching component for the student. For me it also confirmed that educational objectives work best when they are allowed to evolve as ideas take shape during the writing process. It is truly a dynamic process in which writing leads to the generation of new ideas. These feed back into the further development of educational objectives, which in turn aid the ongoing writing process. I do not believe educational objectives should be written at the outset and regarded as set in concrete.

I do not claim that outlining on the computer would work well for all authors. I continued to elaborate and typed the text in the introductory topic, despite limited keyboard skills. In the case of the full subject of Estate Planning this task was too great so I used a dictation machine to perform the elaboration process once an extensive outline had been established.

Why use outlining?

I have reflected on why this process worked for me and sought guidance from some of the literature. A variety of suggestions have been made. The following propositions record my interpretation of what is claimed:

1 Outlining helps good writing by facilitating ready changes to the writing plan (Hayes and Flower, 1986) cited in Eysenck (1990: 350); *User Guide for the MaxThink Computer Program* (1986: 82).

2 Hierarchical structuring (outlining) is an efficient method of representing information (Touretzky 1986: 2). This can facilitate:

- pattern seeking and pattern recognition capabilities of the brain, which can lead to the transformation of old information into new configurations (based in part on Williams and Stockmyer, 1987: 18–21 and Papalia and Olds, 1986: 57);
- the organisation of a larger structure and more complex relationships than you can keep in your mind (*User Guide for the MaxThink Computer Program,* 1986: 82 and 107), especially when a hierarchy is established in which each category contains preferably up to seven and definitely no more than nine items (Miller, 1956);
- a reduction in attentional overload by freeing space in working memory, thereby enabling the writer to focus on the single process of translating ideas into text with consequent improved writing performance (Kellogg 1988: 356).

3 Outlining creates a framework for expanding your ideas (*User Guide for the MaxThink Computer Program,* 1986:86).

4 Outlining facilitates reducing information into its component parts or concepts (*analysis*), combining existing information in new ways (*synthesis*) and comparing and contrasting information to some standard in order to measure significance, value and importance (*evaluation*) (*User Guide for the MaxThink Computer Program,* 1986: 87).

None of these propositions are dependent on outlining being done on a computer, however the computer does streamline the process.

Revisiting the mud

By becoming a subject specialist I came to appreciate at first hand the critical issue of *relevance*: what students are expected to learn must be relevant to their goals. By 'standing in the shoes of the student' it is possible for the subject specialist to derive information about what a student might need from the teaching–learning program.

It confirmed that simple instructional procedures for subject specialists can work in appropriate circumstances. A simplified procedure for authors might be to:

1 List topics
2 Generate sub-topics and sub-sub-topics
3 Write draft educational objectives

4 Elaborate the topics and sub-topics with textual material
5 Insert intext activities and reflective questions to check concept learning and provide reinforcement
6 Refine educational objectives.

Most significantly, I learned that I could use an ideas processor on a computer to advantage. Outlining capabilities did help to generate the structured hierarchy of the study guides and to elaborate it to an almost finished product. Then the wordprocessor took over for checking spelling and formatting. Using an ideas processor (outliner) on the computer may not be a universal recipe for author success, but it will aid some subject specialists as they develop study guides.

Swapping hats in the mud was a rewarding experience.

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CHAPTER 4

A tale from the mud

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In his editor's invitation to instructional designers to write about their experiences, Michael Parer expressed the hope that 'each contribution would emerge "from the mud" as it were'. So while reflecting on projects we had been involved in, and trying to decide which might be the 'muddiest' we resolved to 'reveal all' concerning our efforts to produce 'Studies in Practical Garment Design'. Herein lies the product of our labours.

To make some sense of the tale, we had better explain who we are. David is (or was!) an instructional designer (called a Program Development Officer in Hong Kong), and Gail is an academic in the Polytechnic's Institute of Textiles and Clothing (ITC). Our task was to work together with the help of others from within and outside the Polytechnic, to produce learning materials for a distance education course for supervisors in the garment industry. 'Studies in Practical Garment Design' was one of 18 subjects in the course.

Our aim in telling the tale is to show that development of learning materials does not take place according to the kinds of models that one typically comes across in most instructional design text books. We might even argue that such models restrict rather than foster the kinds of creative processes that are necessary for effective course design. The reality of course development and design is often confusion, conflict, ambiguity and uncertainty. This reality should not be seen as a problem, but as a stimulating and creative environment in which quality course design can flourish.

Of course it is necessary, but not sufficient, to describe what happened. So we decided to split the chapter into three parts. In the first, Gail provides a history of the course development, the 'muddy bit'. Part 2 gives David the opportunity to place the history in a theoretical framework (making 'order out of chaos'). The third is

a conversational reflection to add perspective to the other two and decide what we had learned.

In structuring this chapter in this unusual way, we are aware that readers will have a variety of responses to it. Some may not wish to know the details of the development (perhaps because of being in plenty of 'muddy' situations themselves), and so may skip straight on to the theorising. There are others who recoil at protracted theorising (or who would like something more prescriptive) and so will avoid Part 2. We also realise that some readers are irritated by conversational reflections (too much 'navel gazing'?), and so Part 3 will not be for them. We hope, though, that some aspects of our deliberations will have sufficient appeal to all readers to make our contribution worthwhile.

Years in the making, the course, the Certificate in Textiles and Clothing Manufacture, has now been successfully offered by Hong Kong Polytechnic since late 1986. This tale concerns the final subject of the course to be developed. As is usually the case with most distance education enterprises, the first units were offered before the last units were developed – this unit was produced in 1988 for use in early 1989. Preparation for production, though, had started long before.

Part 1: A little history – Gail

The proposed module 'Studies in Practical Garment Design' was a particularly hot potato, at least for ITC staff. For various reasons it was passed from hand to hand until it was decidedly cooler. For example, creative staff held the belief that design was best taught on a one-to-one basis in the studio, where techniques could be demonstrated and faltering steps mastered with the help of the lecturers *ad hoc* instructions, plus the inspiration of their charismatic presence. 'Classic' teaching philosophy is probably the cause of their reservations: a typical, elementary or foundation course in design begins with the development of skills in handling various media (such as pastels and paints), exercises in illustration (static, animated and modelled poses), variation on illustration themes for a variety of garment types (sophisticated, sporting), stylised interpretations of figures and so forth. All such activities were considered difficult in the distance learning mode.

Having passed through at least four pairs of hands, the proposal for the garment design module looked likely to be scrapped by consensus of ITC and Education Technology Unit (ETU) staff. I was asked to take on the module, in addition to 'History of Clothing' which I had already started. With a photocopy of the nearest equivalent full-time mode syllabus in hand, I duly attended an appointment with the Program Development Officer at ETU, and we knocked out some ideas on unit content, activities and the general approach to program design. Within a short time the ETU officer called by to announce that, subsequent to discussions with an industry representative she now recommended that the module be approached on a case study basis. The unit content would now be 'action' based: no more step-by-step exercises, no systematic development of illustration skills, no fundamental foundations on which to build A-line flared coats of silk faille and pencil-slim skirts of wool twill. The proposal seemed mildly eccentric for this level of course – to say the least.

No amount of persuasion, cajoling, threatening or sweet talking would the officer. Already fifth in line for the unpopular project and feeling dumped upon, I was reduced to indistinct mutterings about PhD-holders who ventured on occasion into the real world, and subsequently deluded themselves that they understood industry; about deals struck over a glass of ale; about tails wagging dogs, and worse. The industrialist's name was never revealed. Had I known it I would have indulged in a subversive telephone conversation, dragging in every underhand trick in the 'how to win' book to reverse this employer's opinion. Luckily or unluckily, a full itinerary and a pragmatic mind prevented such indulgence. A case study at certificate level? Why not? Everyone needs a challenge or two extra in the academic year to keep on their toes.

Exit abovementioned program development officer, enter David Murphy. The time was ripe to revert to earlier decisions, to whip out the references to case study development from the files, to deny all knowledge of anything but the safe haven of step one, develop skills with different media, step two, practise drawing the eight-head figure for fashion illustrations.

However, a few winds of change had been blowing through the Polytechnic since the initial meetings between ITC and ETU on course development. The trend was to develop teaching materials with a local emphasis, particularly since the professional diploma

programs, typically related to overseas professional institutes, were being replaced by local degrees. ITC staff, in common with those of other departments, were busily conducting surveys and writing papers of the 'this is how it is done here' variety, condensing these into special interest talks, case studies and the like for students of full-time courses. A further change was to increase the student-centred emphasis of teaching, for which case studies and related activities are ideal. A case-based module for the distance learning certificate course began to have more appeal.

Development of learning materials

Representatives of industry differ in their approach to requests for help from educationalists – here as in other parts of the world. Those who do show an interest in students will generally be heavily put upon to turn up for critique sessions, to offer employment to graduates and a host of time-consuming activities in between. I was lucky enough to know an industrialist in Hong Kong who had always offered support in the past, an exceptional woman who not only employs students and makes 'guest appearances', but also stops to chat with students in chance encounters in the street.

After preliminary discussion of the objectives of the distance learning program, and the proposed form of 'Studies in Practical Garment Design', she agreed that her firm should be the one to form the basis of the case study. She delegated the public relations manager to work with me on details and gave me *carte blanche* to talk with anyone, including designers, merchandisers and fabric department. Thus all related personnel could be called upon to explain their part in preparing for a collection. We decided that the most recent collection would be a satisfactory core for the case since schedules, sketches and working drawings, fabric samples, trimming and other related documentary evidence of the company's preparation for the new season's products were already available. Since much of the decision-making process was unrecorded, this was pieced together through discussions.

This company was considered ideal as the focus for the case because:

- it has a high profile in Hong Kong – there are sufficient stores in prominent places for all students enrolled on the certificate course to see the merchandise and assess the fashion image;

- it is very open in the sense that the management are keen to welcome students for visits to see how they operate; many fashion companies, on the other hand, are highly secretive and conscious of copyists;
- personnel from the company were familiar with the Polytechnic courses and willing to participate in the development of course materials with an industrial bias.

The marketing calendar

Stage one in our case-study based module was to map out a calendar for the activities which would take place during the run up to a new season. For the purposes of the case, industry activity may be said to operate on a two-season cycle, a simplification of what happens in reality, however it allowed the case to have a clear outline and model style. From her in-house seat, the public relations manager mapped out in chart form the schedule of activities for the preparation of the collection, noting at each stage who was involved, what activities took place and any factors affecting the action. Supporting materials for illustrating explanations of activity were also gathered, including cuttings of fabrics used for the collection. This provided the basic structure for the design of the units: what remained for me to do was to provide further background, light and shade, in order to clarify certain issues, for example inspiration for design.

In any industry the expert who performs similar tasks day in, day out, may be unable to describe the decision-making process which leads him or her to arrive at certain solutions to problem – and so it is with design. A professional, if asked why he chose a particular approach, would very likely wonder why such a foolish question had been asked, rather than dredge the sub-conscious and provide a detailed answer. Nevertheless, such details are of interest to students who either hope to practise design themselves or gain an appreciation of what it takes to be a successful designer.

For this reason, much of the 'meat on the bones' of the basic structure provided by the company was added by myself, for there is a limit as to how much one can strain the bonds of friendship with contacts, interrupt daily procedures or impose on hospitality. Likewise, I did not spend hours in consultation with the staff, interviewing them for opening units on the subject of Hong Kong's clothing industry, or

a typical organisational structure, or even the psychology of the merchandise buyer. Every attempt, however, was made to integrate such topics with the core material about the company.

Working with the instructional designer

An elaborate chart relating information from the firm and a motley collection of visuals were the starting point for further conversations with David. Still somewhat sceptical about how this sketch of a company and its preparation for a new seasonal collection was going to be transformed into a distance learning package, I recall several encouraging 'instructions' which emerged from our meetings, among them 'leave it with me', and 'put it in the too hard basket'. 'Leave it with me' generally resulted in an artfully contrived plan of action; 'put it in the too hard basket' meant a much-needed space of time in which to mull over ideas, search for inspiration or tide over a period of exam and assignment marking.

A session of 'automatic' writing would result in a unit or section of the module being deposited triumphantly on David's desk; he would alternately ponder, probe, cut-and-paste, rewrite or on occasions leave totally unadorned the decidedly raw material provided by the rambling content writer. Activities, check questions, prompts and 'stop and think' items were rarely provided by me 'in process'. Instead, David would invariably determine where and when the thread of the design story was looking tangled and identify key points which required further explanation, or warranted an activity being assigned. About nine parts through the 10-part module I think I was able to outguess him and had become sufficiently disciplined to write shorter paragraphs– even a summary of what had been discussed in the preceding unit, before commencing a new one. Nevertheless, I have cause to believe that the title 'Instructional Designer' makes far more sense than that of Program Development Officer, or a series of others used at ETU in the past.

Case study vs conventional approach

It is unlikely that any student of the certificate course, having studied and achieved the objectives of 'Studies in Practical Garment Design', would prove capable of achieving professional standards in initiating new concepts, drafting concepts on paper, coordinating tasks for the preparation of a new, seasonal collection, or related activities. On the other hand, private study, short courses and in-house practice would

conceivably enable a graduate to practise design in industry. The approach stressed for the certificate program was that of appreciation, so that by achieving an understanding of what is involved in putting together a collection, a graduate would contribute more effectively, and hopefully more enthusiastically, to related functions. Logically all employees of a clothing firm should have the opportunity to see what is involved in the creative process, from the factory floor upwards. Whether the best way to do this is to invite them into a design studio, open up boxes of crayons or markers, and attempt to produce original sketches of fashionably clad, idealised human figures is open to question.

By opting for the case study approach the fashion design process was firmly anchored in its industrial setting, inclusive of marketing research, costing, presenting the collection to retail shop manageresses, and even the projection of company image on delivery vans and carrier bags. A degree of synthesis is therefore involved, which may or may not otherwise take place in the mind of the student. Instead of having to assume how the budget relates to the origination of ideas, or how painted areas of the first sketch are translated into tangible fabrics of a certain texture or colour (which will wash, maintain their shape or otherwise perform), this information is provided in the case study.

The transformation of ideas into tangible products still, it must be said, is left for the student to comprehend as well as possible without actually trying out such a process through hands-on experience. In addition, much of the confusion of the selection process – which idea will be a winner, why pay one dollar more for this fabric and reject that one – is left intact. Nevertheless the work of the fashion designer is such that invariably all students have a fascination with the associated job responsibilities, and in this case study the myth of fashion design was left unexploded!

The outcome

At the outset the prospect of picking up the design module, firstly with the intention of presenting studio techniques between the covers of a booklet for self-study, and secondly with the instruction from above to work on a case study basis, was daunting to say the least. Not one colleague could be prevailed upon to work together in a partnership or team, and the existence of a Program Development Officer was one extra layer of bureaucracy to be dealt with, rather

than a supporting, inspiring assistant in the task of producing the end product. The team at the end of the day comprised the designers, merchandisers and others from the company: effectively I was the observer, to report on and add some further information to their endeavours in preparing a fashion collection.

Ultimately David was the one to unscramble a puzzling assortment of notes, charts, fabric swatches, photographs and half-baked ideas. What initially looked like a trial to be undergone with fortitude and gritted teeth turned out to be quite painless and on occasions, good fun. The company proved to have endless patience – for example when I needed more fabric samples and the rolls had long since exited the company doors, the fabric section searched South East Asia for substitutes; and when David and I arrived at a retail outlet complete with cameraman and tripod, we were permitted to wreak chaos until all angles of the shop had been shot. In the process of putting together the module, our ever-patient industrialist became an invaluable guide in her role as reviewer and David, I suspect, became more interested in women's fashion than the average instructional-designer-about-town. And I, in my turn, have been inspired to write a book ...

Part 2: A little theory – David

How can we make some sense of this 'muddy' tale? What theoretical perspectives might we bring to bear on the story to help our analysis of what happened and to guide our future practice? As it reads, there seems to be little connection between current instructional design theories (Gagné and Briggs, 1979; Reigeluth, 1983, 1987; Richey, 1986) and what took place in the development of 'Studies in Practical Garment Design'. Some might suggest that it would have been better to follow explicitly one of the theories, thus avoiding the confusion that occurred during development. I don't believe it. What I do believe is that the reality of instructional design is often confusion, ambiguity and uncertainty which, when managed effectively, can lead to high quality course materials.

Elsewhere I have argued that the required skills of instructional designers should include the analyses of ambiguity and coalitions (Murphy, 1990). That is, they need to work comfortably and make decisions and recommendations under ambiguous and uncertain conditions, and must be able to manage conflict, to control and use

it creatively. Further, while the current 'crossroads' state of educational technology (Reigeluth, 1989) and instructional design continues, it would seem most sensible to adopt a pragmatic rather than dogmatic approach to course design (Kember and Murphy, 1990; Merrill *et al.*, 1990a,b).

Organisations and educational administration

To make sense of this case study I believe a useful starting point is the study of organisations, especially with respect to educational administration. This is because instructional design takes place within an organisational context, and our tale is no exception. The influence of the organisation is clearly seen in the history of the project, in terms of departmental politics and policies, changes in personnel (including the instructional designer), changing attitudes to the curriculum and relationships between the ITC and the ETU. So, one way to examine and analyse the case study is from an organisational or administrative viewpoint.

Historically, an interesting period in the study of educational administration was during the 1970s when a number of scholars broke with the classical rational approaches and made imaginative attempts to capture the reality of educational organisations. James March was at the forefront of such forays, and his work with Cohen and Olsen on the concept of 'organised anarchies' (Cohen, March & Olsen, 1972) helped to realign the thinking of educators about the ways that their organisations function, with shifting goals, unclear technology and fluid participation. Attractive notions they introduced included the 'garbage can' model of organisational choice, at odds with the usual rational decision-making and problem-solving models, but more aligned with what actually happens in the organisations they studied, mostly university settings.

Another creative contributor was Karl Weick (Weick, 1976, 1), whose idea of educational organisations as 'loosely coupled systems' drew wide interest. A particularly intriguing image is drawn when he describes schools as follows:

Imagine that you're either the referee, coach, player or spectator in an unconventional soccer match: the field for the game is round; there are several goals scattered haphazardly around the circular field; people can enter or leave the game whenever they want to; they can throw balls in whenever they want; they can say "that's

my goal" whenever they want to, as many times as they want to, and for as many goals as they want to; the entire game takes place on a sloped field; and the game is played as if it makes sense. And if you now substitute in that example principals for referees, teachers for coaches, students for players, parents for spectators, and schooling for soccer, you have an equally unconventional depiction of school organisations. The beauty of this depiction is that it captures a different set of realities within educational organisations than are caught when these same organisations are viewed through the tenets of bureaucratic theory.

Without wishing to draw parallels too closely, this is the kind of unconventional imagery which sits most squarely with the reality of the course development that we have been outlining.

Chaos and post-modernism

More recently innovative ideas about systems have emerged from other sources, most noticeably from chaos theory with Gleick (1987) providing a stimulating introduction to the development and major contributions of the theory. Although originating in the natural sciences, applications have been finding their way into the social sciences, including literary criticism (Hayles, 1989, 1990), educational administration (Sungaila, 1990; Griffiths *et al.*, 1991), educational research (Cziko, 1989) and even distance education (Bigum, 1990).

This broad application of the theory gives us an inkling of its possible significance. That is, chaos theory gives us a different way to think about our world, a new perspective that is not only comfortable with the idea of turbulence, but also sees it as the natural order of things. As Hayles (1990, 143) has succinctly surmised:

Where the eighteenth century saw a clockwork mechanism and the nineteenth century an organic entity, the late twentieth century is likely to see a turbulent flow. The importance of chaos theory does not derive, then, solely from the new theories and techniques it offers. Rather, part of its importance comes from its re-visioning of the world as dynamic and nonlinear, yet predictable in its very unpredictability. What exactly, though, are we talking about? Chaos theory is the popular name now used to describe 'the exploration of patterns emerging from apparently random events within a physical or social system' (Griffiths *et al.*, 1991, 432). The name is seldom used by theorists and researchers in the physical sciences, where the

designation is more usually dynamical systems methods or nonlinear dynamics. At a basic level the theory claims that even within ostensibly stable systems (such as a swinging pendulum), chaotic behaviour can be observed, and within systems which seem chaotic, order can arise.

These seemingly opposing notions need a little more explanation. First, the notion that chaotic behaviour can arise in a deterministic system appears to be almost self-contradictory. However, such behaviour has been predicted or observed in a number of disparate areas, the most well known being the 'butterfly effect', whereby the flap of a butterfly's wings in Brazil might conceivably set off a tornado in Texas (Lorenz, 1979). This idea of extreme sensitivity to initial conditions (minuscule changes in an initial state leading to massive changes in a system) is one of the basic characteristics of chaotic systems and has been observed in many settings.

One can imagine possible applications in education. For example, a student who has a small misunderstanding of the subtraction algorithm early in primary school may later have considerable difficulties with mathematics. Or similarly for two students:

> ... minuscule differences in mathematical knowledge between Lionel and a classmate at the beginning of the school year may lead to quite large, unpredictable differences in achievement between the two students by year end (Cziko, 1989, 19).

Secondly, what about chaotic systems displaying order? The work of Ilya Prigogine has been at the forefront of such theorising in recent years. His book, jointly authored with Isobel Stengers (1984), was originally published in French as *La Nouvelle Alliance*, indicating its emphasis on the convergence of science and humanities.

Describing the work, Toffler (1984) made similar claims to Hayles when he stated:

> ... traditional science ... tended to emphasise stability, order, uniformity, and equilibrium. It concerned itself mostly with closed systems and linear relationships ...

> What makes the Prigoginian paradigm especially interesting is that it shifts attention to those aspects of reality that characterise today's accelerated social change: disorder, instability, diversity, disequilibrium, nonlinear relationships ...
>
> Most phenomena of interest to us are, in fact, *open* systems, exchanging energy or matter (and, one might add, information) with their environment. Surely biological and social systems are open, which means that the attempt to understand them in mechanistic terms is doomed to failure. ... most of reality, instead of being orderly, stable and equilibrial, is seething and bubbling with change, disorder, and process (Toffler, 1984, xiv-xv).

The dissipative structures which Prigogine introduces are essentially open systems at far-from-equilibrium conditions, which are liable to change from chaotic to stable through certain little-understood processes that lead to higher levels of organisation (the phenomenon of bifurcation). Such structures have been identified in nature and efforts are being made to make similar identification and explain similar processes in the social sciences. For our purposes, does course development take place in an environment that can be modelled as a dissipative structure? And if it does, can bifurcation be identified and used creatively to develop better courses?

Sawada and Caley (1985) have used such ideas as metaphors for understanding the emergence of creativity in education, while Doll (1987) has argued the application of dissipative structures as a foundation for a post-modern curriculum.

Doll's presentation, especially the ways that he relates the discussion of post-modernism to the ideas of educators such as Piaget, Bruner and Schon, makes for stimulating reading. His description of a post-modern curriculum seems to fit the kind of development that took place with 'Studies in Practical Garment Design':

> ... there must be, as Dewey realised, a sense of indecision and indeterminacy to curriculum planning. The ends perceived are not so much ends as beginnings; they represent ends-in-view, or beacons, which act as guides before the curriculum implementation process begins. But once the course develops its own ethos, these ends are themselves part of the transformation; they, too, along with the students, the teacher, the course material, undergo

> transformation. ... Here curriculum becomes a process of development rather than a body of knowledge to be covered or learned, ends become beacons guiding this process, and the course itself transforms the indeterminate into the determinate (Doll, 1987, pp.19, 20).

Parallels can be drawn between this contention and the description of the course development process. The curriculum development of 'Studies in Practical Garment Design' did not follow the traditional modernist perspective, with precise means leading to clearly stated ends. Rather, although broad aims were retained, the product of the process bears little relationship to originally conceived plans and the means were constantly changed as the course evolved. Further, as was chronicled in the first section, the curriculum changed from a body of knowledge or set of skills to be learned into a 'process of development' (as Doll called it) for the students.

So to summarise thus far, the work of March and others in the 1970s established that what might be termed chaotic conditions were often the reality within educational organisations. More recent theories imply that if such organisations are dissipative structures, then such conditions not only exist but are desirable if the organisation is going to progress and work at higher levels of functioning. This much stronger claim obviously needs further investigation, the first step being to establish the legitimacy of the contention that educational organisations can be dissipative structures.

Some tentative work has already begun but without conclusive result. Part of the problem is that chaos theory has made the most rapid progress in the physical sciences, where quantitative data can most readily be analysed, mathematical proofs reign and computers allow chaotic systems to be investigated. The qualitative nature of much research in the social sciences, especially education, makes strict application of chaos theory problematic.

An example is provided by Griffiths *et al.* (1991), who have used chaotic systems concepts to analyse a case study in educational administration. They rightly point to the work of Hayles (1990) as the most helpful to scholars in education and attempt to apply her ideas in their analysis. Although, as they readily admit, their results are certainly not conclusive, their 'quick and dirty' case analysis 'left us less than sanguine about its potential, unless applicable precepts guide research design, data gathering, and analysis' (Griffiths *et al.*,

1991, 448). Their scepticism concerning quantitative analysis was tempered, however, with hope concerning the potential intuitive and explanatory value of chaos theory for research issues.

Chaos and instructional design

Not surprisingly, chaos and its consequences have not yet featured much in the instructional design or educational technology literature. In a short discussion article Jonassen attempted to explain the challenges that chaos theory poses to traditional instructional design theory, and suggested how instructional designers might learn to accommodate chaos in their work. Major challenges he identified relate to:

- the assumed determinism of Instructional Systems Design;
- the unpredictability of learners and the learning process;
- the relatively linear sequence of procedures that course designers perform in hopes of affecting learning outcomes; (and the fact that)
- information processing models frequently depict learning as an essentially linear process of short-term to long-term memory, which naturally suggests a linear instructional process. (Jonassen, 1990, 33)

Jonassen counsels against eliminating chaos from theory or practice, choosing rather to encourage instructional designers to employ techniques that serve to accommodate it. This includes a greater use of qualitative techniques, especially in evaluation, and attempts to interact (rather than intervene) with chaos. He thus claims that:

> ... we cannot conquer chaos and render the learning process completely predictable. Rather than controlling the instructional process, we should be integrating those factors, including chaos, that affect learning in our systems. Instructional systems need to be made more dynamic by accommodating or integrating the learner's intentions, political exigencies, social realities, and other chaotic fluctuations into the instructional systems, rather than trying to isolate the system from all these other factors. Technologists need to become more integrative and less analytic. Learning can never be completely predictable, but designers as integrators may make it iess doubtful. (Jonassen, 1990, 33-4)

Our case study as described was certainly replete with 'chaotic fluctuations'. While not claiming that the process was deeply influenced by an appreciation of chaos theory, an acceptance of such radical changes of direction, personnel and other factors meant that the development progressed as smoothly as possible under the circumstances. Whether or not the order that emerged from the chaos was at a higher level (that is, the materials were of a higher quality than might otherwise have occurred) is of course a matter of debate.

This little bit of theorising has meandered from educational administration through chaos and curriculum development, and on to instructional design. It is not meant to be all-encompassing or all-explaining. Rather the aim has been to draw attention to ideas and metaphors which help us to analyse, understand and describe the reality of course development as found in case studies such as this.

Part 3: A little conversation – Gail and David

David: When you sent me your history that now appears in this chapter, what did you expect me to do with it?

Gail: (*With a laugh*) Pull it into line, as usual – put in some questions, comments, activities. No, I thought you'd use it as a rough draft, perhaps restructuring it more appropriately. I didn't think it was necessarily in the right form for a finished publication – whatever you say, if you think it's appropriate. And because you've worked on the various pieces through the development of course materials, there's an assumption there that I've tailored it a little better than I would have done when I started off right back with the history of costume.

David: Certainly for me, when I first read it, a lot of memories came flooding back. That in course development nothing ever is smooth, there are so many unexpected things happening along the way. I think that as writers and course developers we have to learn to accommodate them, to see them as opportunities for doing other things and for developing a good product.

Gail: Well, I suppose like the product that's described, that's more or less inherent in the job. For example if a fashion designer starts with sketches and finishes with samples, and then the merchandiser goes into the store, there's input from other experts

who have different ideas from the designer. So with the best will in the world, whatever product you envisage at the beginning is rather different from what comes out at the end. And I can say the same with the creative process, whether it's a chapter of a book or a study unit or whatever it may be, that's going to be the case. So in fact the end product is always a bit of a surprise.

David: I'm sure it was you that once mentioned the word 'sanitise' (**Gail:** I deny it!) as the job that I do to the author's written work. Really, it did make me think seriously about my job. In a way it made me double think about structuring materials too tightly for people: that something of the author should be left to come through, to give life to the materials; that I must be careful not to take the life out of them in order to produce this sanitised, grey product. Is it something that you have strong feelings about?

Gail: I guess that stems from my subject specialism – I teach design management and a lot of what we try to put across to the students is to leave the signature of the designer as the personality behind the clothes. So whatever that signature comprises, there's an element there of untidiness – sometimes it's just that final thing that sells the garment. Like if you have something from a name designer, whether that be Montana or Jean Paul Gaultier, they've dreamt up the prototype, which is exciting for reasons which are difficult to define. It may not necessarily be followed through to a perfectly engineered product, but it still draws the attention of the customer.

David: I think you're right. I mean I'm now keenly concerned about this issue of ownership – as an instructional designer, I have to be careful not to take over someone's product, assuming that it's mine. I'm there to work alongside them and their teaching, not to take it over as my package.

Gail: Well, I'm not very proprietary. I mean if somebody wants to take a handout or a case study and play with it and make it their own, that's fine. I have no problem with ownership in the sense of owning. Again, the outcome, what is the level of interest, that remains. I think there's a lot of ego tied up with that, as there is with fashion designing. I guess Montagne would maintain that unless there is sufficient remaining in the design that he feels is his, he won't put his name to it.

David: He has the right, as you have the right, to either have your name on it or not. (*Shared knowing laughter – Gail had her name taken off the cover of 'History of Clothing'.)* Well, can we get round to having a look at the theorising. What were your thoughts when you received my first draft of the theory part of the paper?

Gail: Well there are a lot of authorities quoted that I have no knowledge of. In terms of really digging into theory for distance learning, you're obviously an expert, I have no knowledge of those theory sources. And OK, in that sense we come from disparate disciplines and it should be a good match, that you put yours together with mine and we come up with something better than the sum of the individual parts. I can't really comment with much authority, but I'm pleased to see that you are open-minded to accept input from a non-expert in distance learning.

David: I guess that part of what I was trying to get at is that there are instructional design models that might be summarised as boxes with arrows pointing to each other, and it looks extremely neat and tidy. As long as you just follow the directions and do things in order, your product will emerge from this process. But I don't believe that this has much to do with reality. So what I was trying to do was to look for theories and ideas that more aptly pictured the types of things that went on during our development, because there were incidents that come through in your writing that might have really thrown a standard developmental model – that produced chaos, to use the term I've used. But ultimately as things were reconstructed, I thought we produced quite a good product. It was that kind of image that I was trying to get across in the theory discussion. Did any of that come through to you?

Gail: Mmm. I go round and round on occasions with the students discussing this point. I think that Theory A suggests that you should take a thesis and then prove it. Effectively that would be similar to what you say. And Theory B suggests that you go out and explore in the open market, and then you come back and piece together a product. I think both methods are valid. It's like having a discussion about action research. Do you sit in the library and dream about something and apply it to industry and then prove that it's true? Or do you go out and seek problems in industry that need solution and then come back and formulate some model later? This is the point at which I send students out to the library and look at Tom Peters 'Thriving on Chaos' – he doesn't seem to care. Basically you

can ride with the flow and apply it to your foundation of knowledge and then come up with a product. For me the matter of assessing that product and whether it's valid or not is another story, but it's a question of flexibility and coping with change. So I think we coped very well with change.

David: I agree. Coping with change is one thing that instructional designers have to learn. Things aren't structured, there's a lot of ambiguity, there's a lot of things that will happen during the developmental process, so that at the beginning you can't neatly specify all the aims and objectives and know what's going to appear at the end. Certainly for me, and probably for you, what we ended up with bore little or no resemblance to what we thought we were going to end up with many months before when the whole thing started.

Gail: And to some extent, that makes a straightjacket for you anyway, because if you've such tightly defined aims and objectives, that really is going to stifle some of the creativity. It's a bit like the design brief. If you start with a brief which is too prohibitive, then it's very hard to instil any enthusiasm within that brief or to come out with something which is different from existing products. Because usually the model has stemmed out of the existing situations. How are you going to stimulate the buyer of fashion products if your new product is too similar to existing ones? They will simply go back and buy the existing ones.

David: I guess it's getting around to what I've tended to believe, that instructional design should be more thought of in terms of the other design activities. Designers do work in a different, more creative way, and instructional designers themselves should be allying themselves more with the design world than say with the more straight instructional world. Would you agree that the instructional design process is really design, that it is like fashion design, graphic design and all these others? Is it really design?

Gail: I suppose it's a question of being a 'renaissance man'. The term's a little bit hackneyed, but basically someone who can appreciate the arts side, the science side; highly structured, highly unstructured; then still come out with solutions to problems.

David: I've probably said enough about the theory. Do you have anything else?

Gail: Time. I think one of the factors we've missed is that in scheduling any kind of activity or project in the fashion business, whether we can stick to it or not, the scheduling is always very serious. We always start this sort of project with a fairly good understanding of budgetary restraints and what the students need, aims and objectives and so on. But not necessarily how to complete a product within a given time. That does put a slightly different edge on it, you know, whether education must be bound to keep to certain schedules and produce things on schedule, to deadlines ...

David: Is that like the difference between design and art, in that a designer has to have a schedule ...

Gail: Well unfortunately not in the present time. You've met Justine Johnson already. She's an American painter and she works with dyes and fabrics rather than with oils and canvas, but in a recent discussion with her, in order to pay the rent and not starve, she needs to produce X number of works within a given year. Basically, everybody has time constraints. Certainly with the way the fashion business is going now, there's a lot of pressure to get a certain number of styles, to get more excitement in the marketplace and keep ahead of the competition – the quick response idea. In our Polytechnic this is increasingly the case, in that we keep up with City Polytechnic or whoever the competition may be, to provide course materials within a certain timeframe.

David: So that's something that hasn't necessarily come through in our writing yet: there's this tight scheduling and the pressure that we feel all the time ...

Gail: Only for the reason that we're always in the experimental stage. I mean this was a one-off, it was something new; it had never been done before. There were no records to source or to apply similar sorts of constraints.

David: It got fairly tight near the end. The students had started before we finished, ...

Gail: Yes but the assumption was, having got nine parts through the project, that we would indeed finish before the last modules were required. Obviously the course can start if you've got 90 percent of the teaching materials. I don't know from the academic planning because I wasn't that involved at the beginning. I wonder

if educational institutions as a whole consider this part particularly seriously from the outset?

David: They don't take their schedules seriously?

Gail: Well if they have a schedule it's like 'it takes as long as it takes' – this is a phrase that I used to hear in America. Quality almost by definition needs as much time as is necessary to achieve that standard. That's a new one to add to sanitisation . (*Again, shared laughter, bringing the coffee and conversation to an end.*)

Conclusion

The conversation as recorded may seem to have ended in mid-stream, without coming to any definite finish, consensus or firm direction. This should not be surprising, considering the position taken in this chapter about course design in distance education. Equally, the theorising was not conclusive and even the history continues, as the course materials are currently being translated into Chinese, introducing a whole new set of challenges to be overcome.

And so we leave this muddy tale with the conviction that there's a lot more to find out about how to develop distance learning courses, and a lot of interesting work and theorising to be done.

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CHAPTER 5

Amber waves of grain: a dialogue

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We describe the process by which an instructional designer and a university instructor developed a distance education course. While the development process was a fluid, integrated one, it contained all of the phases typically used in instructional design and development (eg Dick and Carey, 1985). These phases are: analysis, design, development, implementation, evaluation, and feedback and revision. We address each phase in turn. We use the technique of dialogue to emphasise the ongoing exchange that occurred between the instructional designer (Karen) and the instructor (Debi) in developing Cereal Science, a university course produced during one calendar year at Kansas State University. Both individuals were at the university at that time.

Course description: Cereal Science consists of 32 videotaped lectures, a study guide, a sample book, a textbook, four unit exams, four review sessions by audio conference and four mini-lab assignments. Students enrolling for graduate credits are additionally required to write a term paper. Students enrol through the Distance Learning Program in the Division of Continuing Education at Kansas State University. Cereal Science is taken for three credits, either upper division undergraduate or graduate credits. The semester-long course was designed to be self-paced and students can enrol in distance education courses at any time during the semester.

Distance education technologies: videocassette tapes, audio teleconference, postal service, facsimile (fax), electronic mail. Subsequently satellite video teleconferencing was used.
Description of the university: Kansas State University is the state's land-grant university and has strong agricultural ties. The Department of Grain Science and Industry is exemplary nationally and internationally. In addition to having a wide array of credit course offerings, it has a new extrusion laboratory and offers workshops and institutes through the International Grains Program and the Food and Feed Grains Institute. Credit course offerings include Baking

Science, Milling Science, Feed Science and Cereal Chemistry. The Division of Continuing Education provides distance education courses through printed course materials, audiotapes, videotapes, interactive television and teleconferences (audio, video or computer).

Phase I: Analysis

Debi: My department head has asked me to develop and teach a distance learning course called Cereal Science, and it's to be ready one year from now. As my current departmental responsibilities are primarily to conduct research in cereal science, I have taught only short courses and isolated class sessions for other professors in the department. How will you be able to help me?

Karen: This is what we'll do. I'll work with you first on an overall plan and then we'll meet on a weekly basis on the specific lessons. Let's begin by talking about the potential students and their backgrounds, where they are located, what you hope they will learn from the course and how you plan to deliver it.

Debi: The students will probably be working in some aspect of the food industry, or else teaching. Some of those working in industry will already have a Bachelor's degree, while others won't. There will probably be a few who want to work on their Master's degree. I guess that most of the potential students will be older than the typical university student, because they've been working for a few years. The students could be located anywhere throughout the world, because the cereal industry is important everywhere. Many universities have departments of food science, but few of them teach courses in cereal science. I imagine that we'll have lots of students from Kansas, because of the high reputation of our program and the fact that we grow so much of the nation's wheat.

Karen: You already have a good picture of the potential students! We'll talk later about ways to publicise the course, such as through conferences and seminars, and obtaining mailing lists. Let's discuss what you plan to accomplish. What are the course goals and what do you hope the students will be able to do or learn by the end of it?

Debi: I plan to present the same content that is offered in the on-campus class, so students will learn the same as if they came to campus. The course aims to facilitate the understanding of how and why we use cereals.

Karen: What specific objectives do you have for students in the course? We usually describe objectives in terms of observable behaviour, using active verbs such as 'describe', 'verify', and 'compare and contrast', rather than 'understand' and 'know'.

Debi: I'll have to think more about the specific objectives. If I look through the table of contents of the textbook I'll be able to judge better. *(As Debi looked through the textbook she wrote the following list.)*

- List the common cereal grains presently used for food and know their general physical and chemical composition.
- Identify the major and minor biochemical components of cereal grains and describe them and their functions in foods.
- Describe changes that occur during storage of cereal grains.
- Outline the basic principles and describe current practices for dry and wet milling.
- Describe the common processes used to convert cereals into finished food and explain the significance of each major step.
- Outline a number of industrial applications for the cereal grains.
- Summarise the relationship, both functional and nutritional, between the common cereals and commonly associated non-cereals, such as buckwheat and soybeans.

Karen: Those are great! Now let's talk about the ways to deliver the course. The distance education courses that we offer are an integrated package, usually combining videotape or audiotape and printed materials. The printed materials you will develop include your syllabus, testing materials and a study guide which helps students follow the content presented in videotapes, audiotapes and textbook. We have a proctoring system that enables students to take exams wherever they are – close to their home or worksite. We also encourage arrangements for students to ask questions of their instructors on a regular basis. This may be particularly important if students from a single company take the course together. They can keep the same pace throughout the semester and support each other. If you require exams or tests or other assignments, they can take them at the same time. What are your reactions?

Debi: I know that my department head expects a video product. We'd also like to be able to use videotaped lessons for on-campus class sessions when the instructor is away at a conference. What arrangements can you make for students to ask me questions? That would be useful before the exams and even during lab assignments.

Karen: We can arrange question and answer sessions by audio teleconference. That way all students can benefit from each other's questions and your responses. You may even plan specific procedures and assignments for students to discuss on the telephone.

Debi: Industry personnel are away from their offices a lot, so these teleconferences will have to be optional, not required.

Karen: Remember that people can make a toll-free call from wherever they happen to be when the teleconference is scheduled. They don't have to be in their offices or at home. They just need access to a telephone.

Budget discussions ensued, as did those entailing marketing procedures. The administrators decided to have the lessons taped in the new video production studio on campus. Debi compiled marketing ideas from the instructor that teaches the course on campus. One was to develop a promotional videotape that could be used at the annual convention of the American Association of Cereal Chemists.

Phase II: Design

Debi showed Karen the course syllabus which consisted of four units, each containing several of the 32 lessons. Karen proceeded to describe the lengthy process of designing a course.

Karen: I see that you've developed your syllabus according to discrete modules. That's excellent! We'll probably take longer in designing the first lesson so that you'll understand the process. The procedure will be for us to meet initially with the video producer to go over each lesson. Following that you will have a 'blocking session' in the television studio about the video production aspects. After that you and I can discuss any other technicalities. On the day of a production, just a few minutes prior to starting, you will go over that particular lesson again with the producer and director. After production you will discuss it with both producer and director and with me.

Debi: What's the difference between a blocking session and the discussion just before the production?

Karen: That's a good question. The blocking sessions, which generally take place a week before a taping session, are for you to explain to the producer your ideas for the next productions. You will show him samples of your visuals and work out the details of the production, particularly aspects that need special attention, like demonstrations and the incorporation of any slides or video roll-ins. The producers and directors need to know precisely what you have in mind, because they will determine how to make it happen on screen.

Debi: The blocking sessions do sound very important.

Karen: When you go into the studio for a taping session, camera ready copies of graphics and all other visuals need to be in place. In addition you will have two sets of your notes (or a script or outline) and graphics – one for you and one for the director. You'll need to let the director know in advance when he will shift from one camera to another – between the overhead camera and one of the cameras that shows you, either up close or at a distance. And in your notes you should specify what kind of graphic, slide or demonstration you expect to use.

Debi: I understand the difference now between the meetings with the producer. I think I'll mark the graphics and demonstrations in red on the outline and number them according to their order of presentation. That way they'll correspond with the actual graphics, which I'll also number.

Karen: That's an excellent idea! Let's back up and figure out how much time is required for each lesson. A major difference between teaching face-to-face and at a distance is that with distance education you have to prepare each lesson well in advance – about two weeks. During this time you will integrate the videotape with the information in the study guide and plan your test questions.

Debi: That sounds like a lot of work. Thank goodness I'm on a research grant and have some flexibility with my time!

Karen: I agree. Let's take a look at the first lesson now. According to your syllabus, the first lesson in Unit I is 'A Grand Overview of Cereals'.

Debi: I don't want to start with that unit, because I've never taught it before, and because the first lessons will involve the chromakey for a series of slides. I'd rather start with the second unit.

Karen: That's even better because by the time you return to tape the first lessons you will be more comfortable with teaching in front of the camera. Even experienced video instructors begin in the middle and return to the beginning for just that reason.

Debi: My department has promised to support me in this venture. I can consult with experts in each of the areas, and in fact another faculty member will teach one of the lessons himself.

Karen: What a wonderful resource! Will you be responsible for all of the other lessons?

Debi: Yes, I will. But I'll need to work with him on his lesson, to ensure that his presentation is consistent with mine.

Karen: Yes, you will. Let's leave that for a bit later and tackle the first lesson now. OK?

Debi: Fine. How shall we progress?

Karen: For our next meeting you will first need to write your initial outline of the lesson. Then what you hope that the students will achieve by the end of the lesson. These are the learner objectives and you should identify the objectives for each lesson. Your test questions should test those objectives. Next, prepare graphics, like overhead transparencies, that clarify the points that you want to make and provide the structure for the lesson, with an overview and a review. The approach that we will use in this lesson on harvest and storage will be the same for each lesson – only the content will be different.

Debi and Karen's next meeting dealt specifically with the lesson on harvest and storage.

Karen: I see from your lesson overview that you will cover the ways that cereals are harvested, dried and stored, and the benefits and problems associated with each function. What are the learner objectives?

Debi: I already thought above the objectives because I knew that you would ask me for them. Here, look at them.

Objectives: Harvest and Storage

- Explain why proper harvesting and storage of grains is important.
- Explain how pre-harvest conditions lead to damage to grains in the field.
- Describe the two steps involved in harvesting; describe three harvest problems and explain their impact on stored grains.
- Analyse the advantages and disadvantages of four methods of post-harvest storage and their appropriate applications.
- List and briefly describe three types of storage problems.
- Explain the advantages and disadvantages of three methods of controlling moisture during storage.

Karen: Those look very good. You are already aware that the test questions should test the objectives. Now let's see how to teach for those objectives. What is the content that goes with the first objective?

Debi: Well, cereals are harvested once or maybe twice a year yet are consumed all year long. The success or failure of storage is influenced by environmental factors, particularly moisture, temperature and oxygen. We want to avoid contamination by insects, rodents, fungi and micro-organisms which consume and/or contaminate the grain.

Karen: How can you ensure that students will have learned those points? We need to consider a couple of issues here. First, you can ask them to do an exercise in their study guide. Second, you should identify test questions from which you will draw when designing the unit test.

Debi: How can the students do an exercise in their study guides while they're watching a video? That would be confusing, I think.

Karen: That's a good question. You can ask the students to turn off the VCR while they do the exercise in the study guide and direct

them to return to the videotape once they've completed it. For about 15 seconds, the camera will fade to black, giving you a short break. How does that sound?

Debi: These are upper level undergraduates and graduate students. Don't you think they'll see the study guide exercises as a bit beneath them? I don't remember being treated in such an elementary fashion when I was a student.

Karen: You probably weren't, because you were taking classes on campus. Instructors of distance learners often tend to prepare their lessons more carefully than do face-to-face instructors, because of the distance learners' inability to get instant feedback or clarification of concepts that they don't understand. What we should keep in mind is that distance learners face a double handicap: first, because they don't have immediate access to you while they watch the video lessons, you need to provide them with short segments of information followed by an activity that will strengthen their understanding and demonstrate their learning of the concept; second, they tend to become fatigued from watching a small video screen and need to have frequent relief.

Debi: That makes sense. How should the exercises differ from the test questions? Surely I wouldn't use the same questions in their study guides as on their tests!

Karen: You're right. The exercises in the study guide may be summaries of the content, so that you will test the students on their memory and understanding of content. Test items on the other hand should ask students to apply what they have learned and to do problem-solving. What might be an appropriate study guide question on harvesting and storage?

Debi: Well, I might ask them to list factors that affect the ability to store grain.

Karen: Sure. Now how about a test question?

Debi: A test question? I can ask them to explain why corn wet-millers should be concerned with how their corn supplies have been dried for storage. I think I'll develop a bank of test questions by eliciting test items from my colleagues. I have to remember, though, that my colleagues' test questions may not be the same as mine, particularly as my objectives may differ from theirs.

Karen: That's true. The test bank is an excellent idea, anyway.

We continued in similar fashion that afternoon with each of the objectives for that lesson. We also discussed ways to prepare graphics.

Karen: Graphics for the video camera differ from those that you would use when presenting a conference paper. For example you don't use overhead transparencies – just the paper from which you prepare the transparency. Your graphics should be horizontal rather than vertical, as would probably be the case on an overhead transparency. Use large font, between 18 and 30 points. Also, have you heard the 'Rule of Sevens'?

Debi: No, I haven't. What is it?

Karen: It means that you can have no more than seven words per line, and seven lines on a page. That includes the title for each page, by the way. Here's a sample for you to use.

Karen gave Debi a page that had a one-inch border with seven lines on it.

Debi: I think I'll make copies of this to use, at least initially. Even though I'll use the computer to prepare my graphics, I can use this page as a model.

Karen: You'll want to annotate some of your graphics on video, just as if you were writing on the chalkboard in the classroom.

Debi: I suppose I'll want to do that sometimes, but not always. Can't I just point to the parts I'm referring to?

Karen: Sure. You'll find a pointer in the studio. For your videotaping sessions, copy your graphics onto pastel paper. The pale blue works out very well on the TV monitor, for example, and you will find a collection of pale blue paper in the studio to use. You should also have on hand multiple copies of the graphics that you will write on, so that you can use an unmarked one if you want to make comparisons later in the lesson.

Debi: Unfortunately my handwriting isn't very good, but my printing is legible.

Karen: Well, printing is easier to read than script anyway. Just make sure that your printing is large enough to read on a small television monitor. You can practise in the studio on your graphics to see how it looks. Get feedback on how it looks on the screen before you begin your taping session.

Debi: I can do that at the blocking sessions, can't I?

Discussion then turned to ways to incorporate the laboratory element into the class.

Debi: The class on campus is exposed to other courses that often include laboratory experiments. Students here also have a chance to view grain samples. I'd like to have the distance learners conduct similar lab experiments and to see real grain samples. I think I could require the students to conduct 'mini-lab assignments' in their kitchens, particularly if I send them some of the ingredients.

Karen: How would you verify whether they have done the experiments correctly?

Debi: I would ask them to write a lab report to send to me. I want to receive the lab reports and return them before the students take the corresponding unit examinations, because their results and my comments should help them prepare for the exam.

Karen: It sounds as though we'll need to use a fax machine to return their lab reports, because the turnaround time has to be within a few days. They can send us their lab reports by fax, too. What are the ingredients that you would send to the students?

Debi: I'll send them a sample of wheat, barley and leaveners for the second, third and fourth experiments. These are products that the students may not have access to, and the leaveners must be carefully measured. They can provide their own flour for the first mini-lab assignment.

Karen: Do you have any ideas on how we should package the ingredients and send them to the students?

Debi: The ingredients for each mini-lab can simply be placed in zip-lock plastic bags and labelled with the appropriate lab number. Because the instructions for each lab will be in the study guide, that should be all they need.

Karen: Fine. What about the small samples of grains and milling products that you've mentioned? Will they be sent the same way?

Debi: I think a book of samples would be easy to arrange. Similar books are already used by other classes and short courses offered in our department. The samples are packaged in small plastic bags, about one-inch square when filled. I could get some student employees in the department to help with filling the sample books.

Karen: Do you want to have the sample book separate from the study guide?

Debi: Yes, because the samples would make the study guide too awkward to handle comfortably. The pages holding the plastic bags of sample grains should be on heavy card. Additional samples of such items as milling sieve cloths could also be included for students to see and touch. These could be printed on regular paper because they are lighter in weight.

Karen: How will you refer the students to particular samples during your video lessons and in the study guide?

Debi: On video I can show the samples in petri dishes at the appropriate time. In the study guide I can mention the specific samples by name and tell them to look at a sample in the sample book.

Karen: You now have so many parts of the course – video lessons, the textbook, sample book, study guide, mini-lab assignments, audio teleconferences, exams – let's figure out a way to navigate students through the parts. We can devise icons or symbols in the study guide to help them find their way visually. Every time you want them to look in the sample book, for example, they will see an icon that represents the sample book. Likewise, when you want them to read the textbook or refer to the additional readings, you can use a book icon.

Debi: If you think that will be helpful, let's do it. The WordPerfect software program has graphics capabilities and icons that we can use. We're using WordPerfect for the study guide anyway.

The icons we selected were:

an open book for assigned and additional readings

a key for the outline of a video lesson

a pointing finger for lesson objectives

notebook paper for study guide text

a pencil for study guide questions and activities

a magnifying glass for sample book

scales for mini-lab assignments

Karen: We also need to keep in mind that this course is being offered nationwide, and potentially to the cereal industry in other countries. Most of the world uses metric measurements, as does the scientific community here.

Debi: It shouldn't be too difficult to incorporate metric measurements. I'll make sure that I include lots of international examples in my videos and study guide. That will be easy, because much of the world – particularly developing countries – relies heavily on grain and cereal products as dietary staples.

This course was used as a model in developing university guidelines for distance learning course study guides, so that university-wide styles would be more consistent. The same cover format was used for both the study guide and sample book.

Phase III: Development

Karen gave Debi some references to help her in developing her lessons. In addition to providing sample syllabi and course descriptions of other KSU distance learning classes, she gave her portions of the University of Missouri Video Network Distance Learning Seminar, assembled by Thomas Brenneman (ca 1989), and a portion of a 'metablock' from the British Open University, by Richard Stevens et al. *(1984). Information included the development of course guides, questioning strategies, contents of the syllabus, and active learning theories.*

In general, developing each lesson for taping required about twice the time for developing a lesson for on-campus delivery.

Debi: Lesson preparation takes so much time because I have to prepare the graphics, find that extra picture, samples, or item for illustration or demonstration; obtain permission in advance to use any copyrighted tables or figures; and integrate all the parts. And you have said that I should write the study guide section and test questions for each lesson as I videotape it.

Karen: Think of it this way, Debi. Once you have completed the course, you will have very little to do as you teach it, other than interact with the students by telephone and grade their reports and exams. If you were teaching a face-to-face class on campus you would have to prepare each lesson before teaching it. And the quality of your teaching is probably higher in the distance education course.

Debi: I guess the greatest challenge is in the development stage, not in the teaching stage.

Karen: Another challenge is to deal with students who are non-traditional, most of them already in the workforce. This means that they probably won't remember how to be a student. You might think of the students as younger than they really are, perhaps like high school students, therefore lacking the study skills that you would expect traditional university students to have. Part of your responsibility is to assist them in adjusting to this new process of learning.

Debi: How can I do that?

Karen: Several ways occur to me. One thing is to remember to use active learning theories. Set up situations where the students can think and act. You must get them to change from being passive viewers of television to active viewers of your video segments. Certainly the study guide exercises that you will ask students to do during a 'blackout' in the videos will help. You should create short segments to be spent on a concept, and then vary the activity so that you require them to be active. First you might prepare them with an overview, then lecture for 10 minutes, and then ask them to turn off the tape and do an exercise in their study guide. When you have presented all the content in this manner, provide a review for them. You're already presenting content in the form of discrete modules.

Debi: Won't they get tired of just looking at me all the time? Of course I will have slides, demonstrations and exhibits with petri dishes.

Karen: Yes, they probably will. But when you incorporate graphics in your presentation, the camera will focus on the graphics rather than on you. Then the students will learn visually as well as orally.

Debi described her visit to the television studio to practise using the chromakey.

Debi: My practice session in the studio was a real trick. I practised showing my slides using the chromakey. The producer had already transferred the slides to videotape according to the list that I gave him.

Karen: Did they record **all** of the slides that you'll use in the course?

Debi: Yes, they did. I need slides for three sequential lessons. They taped each slide for six seconds, allowing enough time for 'freezing' during the chromakey operation. During the practice session I learned several things. First, I had to become used to relaxing with blue nothingness behind me. Looking at a small monitor at the edge of the staging area and still maintaining eye contact with the camera was a unique challenge.

Karen: Did you feel like the weatherman on television?

Debi: That's a fair analogy! I also tried several clothing changes during this blocking session. We already knew that blue isn't a good colour, because that's the colour of chromakey. We were amazed to learn that a bright green was no better than blue. It's good that I tried it ahead of time!

Debi began slowly in the television studio and eventually increased her pace. She brought a change of wardrobe for multiple sessions, so that viewers would not be aware that two lessons were being done at one time. She preferred to appear as though she was teaching different lessons on different days.

Debi: I'm going to begin by taping only one session at a time. Later on, when we become more comfortable with each other, the producer said that we can tape multiple sessions, particularly for shorter segments. The videotapes won't all be the same length, because you have had me organise the syllabus according to modules, like chapters in a book.

Karen: It sounds as if we will need to use our time judiciously. If you script or outline your session, and do your graphics either in freehand or on the computer, fax them to me and I'll take a look and critique them.

Debi: OK. That will be helpful, particularly for the beginning lessons.

A difference of opinion resulted when Karen suggested that Debi complete the exercise responses from the study guide.

Karen: When you return to the videotape from having the students do an exercise in their study guide, you should provide the correct answers, like a self-check. Then the students will know whether or not they have done the exercise properly.

Debi: That seems fairly elementary for a university student.

Karen: It may seem so at the outset. But remember that they don't have another source to find out how they've done.

Debi: That makes sense. But suppose there is more than one correct response for a question? Do I have to mention all the alternatives?

Karen: You raise an important issue. Yes, you should provide alternatives to the typical response. In addition, you should guess what wrong answers the students might have. I imagine that you can get a sample of typical wrong answers from other professors, or from your own experience, can't you?

Debi: Yes, figuring out the potential wrong answers will be fairly easy. I can say something like this, "You might have answered XYZ, but actually ABC applies here."

Karen: That's an excellent approach.

Following each of the first few taping sessions, Karen gave Debi a list of written comments, usually focusing on suggested instructional strategies. Many of the comments were general enough to be incorporated into future lessons, e.g. use examples that relate to the students; signal transitions between topics by changing the pace or returning to the outline; use higher order questioning to elicit higher order thinking. Some of the suggestions concerned specific changes that could not be included unless the session was retaped, and therefore were frustrating to Debi.

After observing one of the taping sessions, Karen remarked on Debi's use of colour in annotating graphics.

Karen: I found that I got confused when you used only one colour to annotate a figure on video. If you use different colours to annotate, your descriptions will be much clearer. For example, you can draw lines and arrows in one colour to emphasise one concept, and change colours to emphasise another.

Debi: OK. In the second lesson, as I discuss decortication, I use a graph depicting how the composition of bran changes as the percent of kernel removed increases. I could use one colour to trace

the protein, a second to trace the oil, and a third to trace the fibre, rather than simply pointing to each line.

Karen: That's an excellent idea. I wonder which colours work best on the screen?

Debi: I can practise in the studio during my next blocking session and find out.

Two of the lessons involved video 'roll-ins'. One was a demonstration which was started prior to taping the lesson and concluded after the lecture portion was concluded. This required backwards thinking in that Debi had to recall during the taping of the demonstration what she had said would happen when she taped the lecture, rather than use the lecture to react to the demonstration. The other roll-in was a demonstration taped in a university laboratory prior to the lesson taping session. Debi found the second procedure easier in that she could actually view the roll-in being shown during the time of the insertion and could react to it as the students would.

Another lesson was a guest lecture, which was taped partially outside the studio. With the department's internationally known extrusion facilities, Debi wanted an 'expert in the field' to conduct the lecture.

Debi: It was hard on my nerves not to have control over this situation – I gave suggestions on visuals but could not dictate. It does add strength to the course, however, to have done it this way.

Completing the sample books required a combination of efforts. Debi's children, aged three and five, helped fill the little plastic bags at home, and later three student employees in the Distance Learning Office helped by stapling the bags in place.

Phase IV: Implementation

The course materials were sent from the Distance Learning Office to the students at the beginning of the semester. The student packets included: course syllabus, study guide, sample book, videotapes, ingredients for mini-labs, a pre-course survey and tips for learning at a distance. After the first two or three weeks of the semester, Debi and Karen discussed students' progress.

Karen: How are the students doing?

Debi: Two have been out of school for a long time and a third just graduated from university. The recent graduate seems to know how to study, while the other two admit to being confused. They have asked me questions on the telephone, which I've answered. I also reminded them that they will have a chance to take part in four audio teleconferences during the semester.

Karen: That's good. Have they turned in their first mini-lab assignment yet?

Debi: Yes, the students faxed them to your office, and you sent them directly to me. They all did very well on their first assignment and we're going to have the first audio teleconference this week. The tips that you gave in the training session for first-time teleconference instructors should be helpful.

Karen and Debi discussed the teleconference afterward.

Debi: Probably the best idea I had for the teleconference review was to include my colleague, who has taught the traditional Cereal Science course for 11 semesters. Being nervous about my first teleconference, I was afraid I might freeze or go blank and not be able to answer a student's question. In retrospect I did not need him there for that reason, but it was more relaxing to have another person sitting in the room with me.

Karen: Were you able to incorporate many of the training tips?

Debi: I adapted the concepts to this situation. I did not mail out any additional information, as it did not seem appropriate. Because the group this time was so small, we kept it fairly informal. I solicited initial questions and did get a couple. Then I started through the actual review, outlining key points from both my video lectures and the text. I went through each book chapter, which was made up of two or three video lessons, encouraging questions as I went. After each chapter I asked one or two questions of the students, calling them by name before starting the question, to determine if they really understood.

The first semester progressed without major problems. Each student passed the course and had favourable comments at the end.

Phase V: Evaluation

We conducted formative evaluations with both students and peers. The students, who were not in the Department of Grain Science, read through the materials, completed a form and participated in an interview. In a somewhat unorthodox manner, Debi herself selected the peers from three areas: the University, the American Institute of Baking, and the United States Department of Agriculture (USDA) Grain Marketing Research Laboratory. The peer evaluation required that evaluators first read all the written materials and view the videotape of the lesson on harvest and storage, complete a written evaluation form and participate in an hour-long focused discussion. Karen gave Debi a summary of the written evaluations and a written summary of the discussion.

Karen: Your peers certainly find you qualified to teach the course! They found the sample lesson well organised, clear and thorough, and they thought that you had a good presentation style on video.

Debi: That's very complimentary. But it couldn't have all been rosy. What suggestions did they offer?

Karen: Well, comments included "too much repetition between the study guide, videotape, and textbook", and "If students include those of foreign origin, some expressions like 'nitty gritty' may pass over them".

Debi incorporated the peer reviewers' comments in the structure of the following lessons. She wrote more challenging test questions that were reflective of the concepts. She used 'bulleted' rather than full text format in the study guide. She ensured that the content in the study guide, videotape and textbook was not repetitive. And she included timely information from outside sources that were not available to students.

Phase VI: Revision

Revision occurred constantly during each of the previous phases, particularly during the development phase. Rewriting of the syllabus evolved with the lectures themselves. Still, after the course had been taught for two semesters, and while Debi was talking via telephone with students in Karen's design and development course, Debi made suggestions for revisions.

Debi: I think you should send the promo tape out to the students when they first enrol in the course. It's a good explanation of the course and describes how they should progress through it.

Karen: That's an excellent idea. I'm embarrassed that I didn't think of it myself!

Epilogue #1: Debi's parting thoughts

One full year after completing the videotapes for Cereal Science, I was asked to team-teach the traditional course while the regular professor was on sabbatical. This involved presenting 50 per cent of the lectures, scattered throughout the semester, and writing, administering and grading the tests. The other member of the team presented 50 per cent of the lectures, wrote test questions specific to his lectures and graded the term papers.

After having adjusted to lecturing to an imaginary audience (only one technician operating the cameras had been present during my taping session) it was almost unnerving to have a classroom full of students, many of whom are not always alert and attentive. Being ignored by the wall is easier on the ego than having students working crossword puzzles during the lecture I spent so much time putting together. With distance education one imagines that the students are listening raptly!

It was much easier to prepare lectures for my face-to-face students, having already thoroughly researched the material for the video lessons. However it soon became apparent that there were areas in which I assumed the students had a better grasp of the text material than the majority actually did. If I were to re-do the videos, I certainly would make changes. However, that is not unexpected, I suppose. Every good teacher updates lectures constantly.

The physical method of presentation also required adjustment. I could convert many of my visuals to over-head transparencies, however the luxury of video roll-ins was obviously not available.

The videos afforded me flexible time, at least the way I did them. It was a challenge to adapt to a strict 50 minute lecture period. Some lessons had to either be stretched or combined with others, and some had to be divided at 'appropriate' places.

The on-campus class was made up of more students than I have had at any one time in the video class. Therefore grading tests was of a marathon I had not previously experienced.

The next phase will be to offer the course via satellite teleconference on AG*SAT (Agricultural Satellite Corporation). The video lessons will be transmitted nationwide to universities and cooperative extension agencies. I will have four live interactive video teleconferences with students, plus a live orientation session by video conference. Given the large number of students who seem to prefer to learn via the broadcast mode, I will encourage them to ask questions by electronic mail and fax in advance of the interactive sessions.

Epilogue #2: Karen's parting thoughts

We wrote this chapter at a distance from each other, which is only natural considering the content! We used electronic mail and the telephone primarily, and fax on two occasions when I sent copies of communications from the editor Michael Parer. All drafts were written and edited by computer, saved in ASCII format and uploaded and sent to the other author by electronic mail. We used brackets [ ] to indicate changes from the previous draft and eliminated the former brackets on each new draft. We talked on the telephone only three times to clarify issues or discuss new approaches.

Debi said that she could not write in the dialogue format I had chosen. "It's not scientific", she remarked early in our plans. As a result, Debi's contributions were in text form. It was my responsibility to convert her information to dialogue and ensure that our writing followed a consistent style.

We mentioned earlier that Debi had not taught this course prior to designing it for distance delivery. As her instructional designer, I was careful to outline the process while giving her ideas about specific lessons. At the same time, it was important for me not to insist on issues that I suspected would be beneficial to distance learners. When we disagreed, Debi made the final decision.

One area of disagreement dealt with what Debi termed 'spoon-feeding' the students and what I termed 'providing a transparent structure' for them. While Debi agreed to have the students stop

the videotape to complete exercises in their study guides, she felt that using 'bulleted' rather than full text format was doing too much of the students' work for them. It was only after a majority of the peer reviewers preferred a bulleted format that Debi changed her mind on that issue.

The entire process of working with Debi – from initial discussion of the course development to the final dot on the list of references in this chapter – has been most rewarding. Effective instructional design includes two oft-forgotten yet important ingredients: rapport and understanding, both of which we had.

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CHAPTER 6

Course development without instructional design

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This chapter discusses the development and teaching of two courses: *A Sociology of Educating* and *Classroom Processes.* A Sociology of Educating was developed by Daryl Nation and colleagues and taught at Monash University College Gippsland from 1989 to 1991. Classroom Processes was developed by Rob Walker and colleagues and has been taught at Deakin University since 1989.

The chapter is intentionally open ended and free-wheeling, taking the form of a dialogue developed from an audio recording of a conversation between Daryl Nation and Rob Walker which took place at Deakin University on December 18 1991. The text has been created by considerable editing and revision of a transcript of the recording, however it remains true to the spirit of the original conversation which attempted to understand how and why each course was created. Each participant has a sceptical view of course development and instructional design as they are conventionally practised in distance education and open learning, nevertheless both regard principles and practices of course development as central to their work as teachers. Their approaches draw upon educational and social theories and research which eschew positivism and emphasise the socially constructed nature of reality. (Evans and Nation, 1987; 1989)

The chapter is a collaborative effort but Daryl Nation takes the major responsibility for the introductory, intervening and concluding statements. The introductory remarks provide some background information relating to each course. The dialogue is punctuated by a brief critical reflection which relates the two courses discussed and the ideas behind them to the critique of instructional industrialism developed by Evans and Nation (1987). The chapter closes with further connections to theories and practices which regard effective education as a critically reflective activity.

Background information: Classroom Processes

Classroom Processes is offered as part of the fourth and final year of Deakin University's Bachelor of Education (BEd) degree and in a wide range of graduate diploma courses. It counts as two credits which constitute one quarter of the work for a year. It is not compulsory for the BEd but the majority of students enrolled in the degree take the course. All students study the course part time through distance education. Most students are school- teachers upgrading their qualifications, but increasing numbers are enrolling from related fields in education and training. Most are Australian but the course is taken by 50 students each year in Hong Kong as part of a collaborative arrangement with the Chinese University of Hong Kong.

An integrated set of audio, print and video teaching materials has been developed. There are five audio programs: an introduction to the course, interviews with two distinguished classroom researchers, a discussion of a classroom case study and two reviews of the course. The first three programs are provided at the beginning of the course and the latter two as progressive reports from the Course Team.

There are roughly 450 pages of printed text which can be divided into the following categories: reprints of academic sources (50%), photographs, etchings and diagrams (15%), a case study which includes photographs (25%) and instructional text (10%). The instructional text has been created by careful editing; photographs and graphics bear a considerable proportion of the communicative burden.

The 125 minute video is made up of 13 clips: nine are audiovisual visits to a variety of classrooms, two are short didactic pieces, two are studio based simulations and there is one 'outside' presentation by David Hamilton which traces changes in classroom organisation and theory.

The printed text is tightly integrated with the video and there are strong but looser relationships between the audio programs and the print materials. All the materials are provided as one package at the beginning of the course.

Classroom Processes offers no face-to-face teaching but students are encouraged to work together in study groups of five. Limited group and individual telephone tuition is provided. The major student-teacher contact is through the correspondence related to assessment. Students are required to complete three major assignments: first, a series of many and varied short observational and reflective tasks stimulated by the video and its supporting text, which are submitted in 'workbooks'; second, a case study based on a classroom setting, which follows a review of the course's case study; and, third, a 'reading log' which requires a critical review of a book selected from a range of recommended texts. Further details of the teaching materials and the teaching process can be found in Morgan (1991: 25-31).

Classroom Processes was originally devised by Rob Walker and Ron Lewis who collaborated on the production of the video with Peter Lane (video producer) and Caroline Coles Velez (video editor). Terry Bennett produced the audiotapes. The printed text was written by Rob Walker and Susan Groundwater-Smith (then of the University of Sydney); it was edited by Fiona Henderson and Trevor Pickles carried out the graphic design. Penny Williams undertook the picture research and acted as a course assistant. There were two other external consultants: David Hamilton (then of the University of Glasgow and now of the University of Liverpool), who contributed to the video; and Philip Jackson (University of Chicago), whose book *Life in Classrooms* is a set text, discussed his long career in classroom research with Rob Walker on one of the audio programs. Chris Saville, an English educational adviser, made contributions as a consultant and an evaluator of the course's predecessor. The current teaching team includes Wendy Crebbin, Wendy Crouch and Helen Modra. Evaluators of the current course have included: Herbert Altrichter, Terry Evans, Lynette James, David Kember and David Murphy. An extensive discussion of some aspects of evaluation has been published. (Altrichter, Evans and Morgan, 1991)

Background information: A Sociology of Educating

A Sociology of Educating was offered from 1989 to 1991 as a second and third level undergraduate unit in a sequence in sociology. Most of its students were enrolled in arts, education or welfare studies degrees and diplomas. It was offered to full time students, most of whom studied on campus, and to part-time students, most of whom studied at a distance.

In contrast to Classroom Processes, its printed teaching materials amounted only to 20 pages. Like Classroom Processes, the printed text was created by careful editing and generous use of graphics. In both cases the graphics are not enhancements but central to the knowledge provided. The text was created from a 'method' rather than a 'content' perspective: it addressed the content found in the set books and encouraged students to explore the pathways between the theories and research discussed in the books and the educational processes they experience in the social worlds to which they belong. However, it was not a set of study questions but a textual embroidery which articulated the teacher's theories of teaching and learning and drew relationships to the practical world. It was designed to be read and re-read. The text employs various 'layers of meaning'.

An important aspect of the text form were nine boxed quotations. Two examples are provided hereabouts. There was a periodical newsletter, *Teacher's Text*, which employed the graphic style of the main printed text. It provided students with the teacher's important announcements. For example, it would provide general comments relating to students' performance on assignments. Typically, six newsletters would be issued per semester.

MY CAREER IS STILL IN BLOOM, AND I'M NOT RIPE ENOUGH TO TEACH ANYBODY WHEN I'M READY I WILL DEVOTE ALL MY TIME TO THAT - I'LL TELL WHAT I'VE LEARNED. MANY OF YOU WILL LISTEN AND SOME OF YOU WILL HEAR.
(Tina Turner I, Tina p.247)

TEXTS ARE NOT MERELY REMEMBERED, THEY ARE RECREATED EVERY TIME THEY ARE READ BY ANOTHER .
(David Lodge , Write On p .78)

In terms of initial reading and listening time there was less printed text than audio text. There were eight audio programs: two differing forms of course introduction, three interviews with authors of set books and a series of interviews with an educational consultant and researcher. The first program offered a general introduction by the teacher. It complemented much of the printed text which dealt with the course's objectives and teaching strategies. The second program had the teacher discoursing on the theories of teaching and learning which were central to his teaching and research; substantial emphasis was given to the importance of practical experience in his engagement with these theories. The program encouraged students to reflect critically on their own experiences as learners and teachers in terms of the theories of teaching and learning they engaged with in the set books.

The interviews with the authors of the set books were designed to give students an understanding of the experiences and intellectual positions of the authors and to get accounts of why and how their books came to be written. The authors were Lois Foster (La Trobe University), Rupert Maclean (University of Tasmania) and Roland Meighan (University of Birmingham). The interview series was with Dean Ashenden. The first interview had been used in an earlier course and dealt with a major research project and a consequent book and other publications which had involved Ashenden and three other university based researchers. The second interview dealt with Ashenden's disillusionment with and departure from academia to work in educational broadcasting and as a policy adviser to the Australian Minister for Education. The final interview concentrated on Ashenden's successful career as a consultant and educational journalist and his sharp criticism of university based researchers and theorists.

As is typical for courses from the Gippsland campus of Monash University, A Sociology of Educating offered face-to-face teaching to both on-campus and off-campus students. The former were offered small group tuition weekly; a series of 'lectures' was not provided. Off-campus students were able to attend small group tuition at four weekend schools which were held monthly throughout the semester. Individual telephone tuition was provided for all students; it was used mainly by off-campus students, especially those unable to attend on weekends.

Students were to complete a minor and major assignment. Both assignments required them to develop a specific topic of their own and to relate theory and practice together. A series of short exercises,

designed to ensure that students covered a breadth of topics in the course, were also required. These could be completed as oral tests face-to-face or by telephone during the semester, or as written tests in the examination period at the end of the semester.

The course was designed and developed by Daryl Nation, who drafted the printed text and scripted the audio programs on a Macintosh computer. Editorial advice was provided by Mary Griffiths, Marg Lynn and Lu Pease. Gordon Dadge assisted in the development of the boxed quotations and supplied many quotations from which to select. Norman Hurrell carried out the graphic design. Brian Doherty and Max Campbell edited and produced the audio programs. As part of a long professional association with the course developer, Terry Evans acted as a critical friend in all phases of development. Betty Dadge and Daryl Nation were the tutors for the course. Further details and relevant critical comments can be found in Nation (1991).

The design and development of the courses

Daryl: Rob, what are the essential aims and objectives of Classroom Processes?

Rob: [Laughs] central aims and objectives? I don't think the course has objectives, although it does have aims. There is no set content to be covered. It's a course in which the content is essentially replaceable: you could take out all the content, in the conventional syllabus sense, and put something else in and the course would remain basically the same. You might ask, if the content is arbitrary, does it have a curriculum? I would say it does but that the curriculum has to be found in what students learn, not in the materials.

Daryl: Why is it named Classroom Processes?

Rob: For historical reasons. I inherited Classroom Processes and at one stage I wanted to change the name, but as it is an important course in the BEd program and a popular one, I thought I was taking enough risks changing the course without changing the name as well.

Daryl: Is it about classrooms?

Rob: Yes, but a contradiction that I became aware of as I began teaching the course, is that it's a course about classrooms but it's not being taught in the classroom. It's a course that essentially undoes its own subject: it is inherently self-deconstructive.

Daryl: In some ways Classroom Processes was a break with Deakin's conventions in course development. Why and how did that occur?

Rob: It's difficult telling the story briefly. As you know Alistair Morgan has written about this at some length. I think it was a combination of things. It was partly an interest Ron Lewis and I shared in the use of visual and non-print media. But it was also a function of the Deakin system, which encourages diversity. In developing courses at Deakin there isn't a set recipe, you are not required to work through a series of steps that are laid out in advance. It's not a conventional instructional design model such as you might find in a textbook or even at The Open University where you're dropped into a slot, told what to do, told what you've done wrong and then asked to do it again, if it doesn't fit. So this course was a product both of my eccentric and idiosyncratic interests, some of which Ron shared, and a production system with a lot of flexibility; the course emerged from a collision between those things.

Daryl: I have the impression that 'development' did not just occur at the beginning but has continued.

Rob: I believe strongly that course writing is only a small part of the development process. Producing materials is the start of the development process, not the end. In the language of science research, the materials constitute hypotheses to be tested, not results. Testing is done in the work of the students and those who teach the course on a day-to-day basis. This course has changed as it's been taught, particularly as other people have come into the course team bringing their own interests and experience. For example, one part of the course that's very loosely sketched out in the original materials, a reading log, has improved immensely since Helen Modra came to work on it.

Daryl: Obviously, I have a different perspective on the course than the people who know it as teachers or students, although I've studied it as a peculiar sort of student and perhaps I've seen it in a less dynamic way than its creators. But I was captured by the first few minutes of the introduction to the video, where you said something I fully agree with:

> *Unlike on-campus teaching, an off-campus course represents an enormous act of faith, once it's gone to press it's too late to change it and it's entirely in your [i.e. the students'] hands.*

That's something that was recorded some years ago and you're stuck with it. How do you react now, if you ever see and hear yourself saying those words?

Rob: I think I feel that more strongly now than I did then; I now see that 'the course' is largely the work that the students do. What we've done is create a structure within which the students create the course. With every batch of assignments I read, I'm more conscious of the fact that 'the course' is actually what the students do, not what we've done. One of the reasons I hesitated when you asked me initially about 'objectives' is that I think it's a trap in distance education to think of the materials as the course. The danger in the objectives model is that we lose sight of educational aims and come to place our writing centre stage, not the work of the students.

Daryl: Well, let's tease that out? Were you attempting to create that type of course and now you're saying you have succeeded?

Rob: No, it wasn't as clear as that. It was an intuition. I think the person who saw it most clearly was Chris Saville whom we commissioned to do an evaluation study of the previous version of the course. Chris set out many of the ideas that we worked through in the developmental stages and that are still active in the course. In his evaluation he emphasised talking to students; he phoned them up, went out to schools and talked with them and their colleagues. His report reminded us that the 'reality' of the course is what the students do, not what we do as teachers. In this sense,

the course is implicitly critical of some other Deakin courses students might encounter, which have moved to a point where their language has abstracted them from the ways in which many of their students think, talk and write. Such courses require their students to become socialised into the language of the course and its discipline base. Ron and I rejected this as an educational assumption and we tried to provide a course that was quite intentionally within what I took to be the language and interests of the students.

Daryl: How have the students and the colleagues that have worked with you on the course responded to it?

Rob: There is certainly evidence that some have seen this as providing opportunities to be involved in a course that is different from anything they've done before. They've got a lot out of it and for some it's been quite a significant part in their lives. On the other hand, there is a small minority who are looking for a relatively simple algorithm to see them through the course. These are generally people who want the credential but who don't necessarily want to have to rethink their lives as teachers, parents or whatever. Some of these students have been astute enough to see that the course is threatening and haven't liked it for that reason. They have virtually said to us: 'Can you tell me an easy way I can pass the course, I just want to get through it.' Helen Modra and I have spent a lot of time talking about these students and how we should respond to them. If you design a course that's responsive and that is the response that you receive, it seems to me you just can't ignore it or take a high-handed attitude. You have to try and respond honestly.

Daryl: Has that type of reaction been evident right from the first year?

Rob: I think it was especially evident the first year. I'm less conscious of it now; it may be that I've just got used to that response. It maybe that the course has created a market for itself. Perhaps we are now less harsh in our demands on students. I'm not sure, but I was especially conscious of those problems in the first year, even though there were probably only half a dozen students among the 300 or so enrolled who reacted that way.

Daryl: You've mentioned your colleagues Ron Lewis and Helen Modra, how have you all worked together as a team? What have you learned from each other? Do people enjoy working on this course?

Rob: I think that many students do. We don't actually work as closely as a teaching team as I think most of us would like to. We do meet occasionally and talk about it. If a student phones up with an interesting question or comment we talk to each other about it. I think we have a shared set of values and expectations, but we certainly don't have regular weekly meetings in which we sit and agonise about the course. We know each other well and we meet on particular occasions and talk about it. Helen's coming into the course was an interesting development. She doesn't have a background in classroom teaching at school level, she was a librarian who had taught university librarianship students. Helen's perspective from adult education sharpened our awareness of the contradiction inherent in a course that's about classrooms which doesn't have a classroom itself. Her arrival coincided with an increase in the number of students who were working outside conventional schools, in training and in similar fields. For them, many of these questions are very immediate and obvious because they're dealing with people who've failed in conventional classrooms.

Wendy Crebbin has brought to the course a good understanding of what it means to be 'reflective' as a teacher and Wendy Crouch, a comprehensive understanding of 'learning'. It takes time for people to come to grips with the course but the main challenge we face in rewriting it (in 1993) is to incorporate the perspectives they have brought to it.

Daryl: Is it necessary for all the students to embrace the philosophy of a process oriented course rather than a course that is structured by content?

Rob: Yes, it is, though this isn't quite such an authoritarian response as it might sound because you can negotiate ways through it. There are some people who resist it, whether consciously or not I'm not sure but they resist it in that they try and rework it into a more conventional course. So they'll try and turn the tasks into questions that have

answers and really resist those tasks designed to disrupt that expectation. However despite this attempt to re-conceptualise the course, which I believe is quite legitimate, we don't have much evidence of plagiarism or of students picking up people's assignments from a previous year and regurgitating them, perhaps because it's very obvious if they do. This course demands a personal response and I think most students recognise this and respect it. Once they identify our aims and principles, most people take us on trust and throw themselves into it. They demonstrate more courage and independence than students in conventional face-to-face teaching where I think anxiety is much higher and risk-taking much more restricted. In my experience, off-campus students are generally less conservative, more enquiry oriented and prepared to take risks.

Daryl: Each person has to put what I would call a 'fingerprint' on their work.

Rob: Yes, that's right. One aim is to uncover gaps in people's experience, knowledge and perception that make them think about why a particular task is difficult for them.

Daryl: Have you had to change many of the tasks in successive generations of the course?

Rob: There have been many routine, relatively trivial changes. We've edited out some tasks that didn't seem to work. We've added some tasks. It's been really fine tuning of the tasks. There's been a lot of that, to the point where the current Unit Guide, which we revise each year, is getting bigger and bigger. It's getting harder for students to manage and so we plan a major revision of the course next year (1993), including a re-edit of the video.

Daryl: Let's explore one more dimension before I invite you to question me about A Sociology of Educating. It could be said that this course is 'vintage Walker': it's Rob Walker implementing his educational theories. You've said in the beginning of the video and I'll quote it a length:

> *I've studied classroom teaching, the management of schools and the administration of systems. I've written*

numerous research reports and papers and several books; but this course is the best thing I've done. It isn't comprehensive in its coverage and it isn't a summary statement; but it draws upon everything I've done. It isn't a theory, but it does represent a synthesis. I'm nervous because a lot of me has gone into it, but now it's out of my hands and into yours. I hope you enjoy doing it as much as I've enjoyed writing it.

Rob: Yes, I still feel that. And you're right, the course does demand the personal fingerprints of the students but this does not preclude the significance of my personal footprint. Classroom Processes was an opportunity – and still is – to do things that I haven't found other ways of doing. Until I came to Deakin I'd only taught very small courses; I'd only really taught research students; I hadn't really taught at this level before. I'd never worked in distance education, except for writing a few things for The Open University. Yes, it was an opportunity to do those things. There is an element of – what's the word? – iconoclasm, and I guess idiosyncracy and eccentricity. I don't think anyone else would have done the course in quite the same way.

Daryl: Did you choose your words carefully when you said 'it's the best thing I've done'?

Rob: Yes, I did, I really felt that then and still do because it's fair to say that this isn't something I've just done off the top of my head. Behind writing this course lies years and years of doing other things, which have all contributed in some way. To be honest, this course has been more important to me for the last few years than any research or publishing I have done.

Daryl: You made that statement I quoted earlier in 1988. Has anything occurred in three years of teaching the course to change that view?

Rob: No, I feel more confident about it now than I did then, although I felt pretty nervous when it went to Hong Kong. Behind that quote is the famous quotation from Lawrence Stenhouse who defines teaching as, 'strategies in the face

of an impossible task'. Successful teaching is a difficult thing to achieve. What you do in putting together a curriculum is develop strategies that you try out, but the curriculum only becomes something real, only fully developed, in the context of being taught. Lawrence was saying that it's teachers trying out things in schools who are at the centre of the action. All a curriculum project team should do is set up a series of hypotheses or strategies for other people to test. And I was thinking the other day – and I don't know why it hadn't dawned on me before, it's probably dawned on everyone else – that there's a direct parallel between the relationship a curriculum development project has with trial schools and the relationship a distance education course team has with its students. In both cases, it's as though you're trying to do something by remote control, you're trying to create action at a distance; it isn't good enough to be right, to convey yourself as a hero and I don't think it's ever right just to tell people or instruct them or provide them with materials or a language or even theories. It's a question of how you engage people's commitment to change their practice.

Daryl: That's very interesting because I think there are people who misunderstand your position, who would think that someone operating with those educational theories wouldn't want to teach at a distance. They would assume that Classroom Processes could never be created by practising those theories. Could we put these ideas aside for the moment and come back to them after you've had a chance to interrogate me about A Sociology of Educating?

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Rob: I won't ask you about its aims and objectives, but I would like to know more specifically to whom is it taught and what are its central ideas?

Daryl: It is offered at second and third level in a stream of undergraduate sociology units. Some students taking it are majoring in sociology in arts or education courses, while others may be taking a few units of sociology in those courses or in others such as police and welfare studies. It's taught to both on-campus full-time students and off-campus

students. It's a course about educational processes. The title is taken from one of the set textbooks and it's supposed to illustrate the notion of education as process, which is a key theme of the course. I came to develop it after years of teaching a large introductory sociology course and it is somewhat indulgent in that I wanted to try to practise the deconstructive theories that I'd been reading about during it's conception. In a sense, I've been practising these ideas all my life, but I'd started to develop a clearer theoretical understanding in these areas in the late 80s.

Rob: What are its distinctive teaching methods?

Daryl: It caters for students both as individuals and sub-groups. It offers guided independent study. This is achieved through a set of audiotapes and printed texts which guide students' study of the textbooks and encourages them to apply the knowledge they gain from them to the educational processes they observe in their social world. This is complemented by group tuition which occurs in weekly classes and weekend schools for students studying at a distance. There is also individual tuition, much of which is carried out by telephone especially for students studying at a distance. The three set texts cater for people who've got different interests: one caters for students who in a sense say 'I'm not interested in sociology or being a sociologist but learning something about education from a sociological point of view' (many of those are aspiring teachers); there are other people who seem to be interested in educational structures and there's one textbook for them; and there's another for people interested in educational processes.

Rob: So the texts are options; the students don't study all of them.

Daryl: They select two from the three for study in depth. One's from overseas and two are Australian.

Rob: One of the things that intrigues me is the contrast between your thin document and my great big file and I couldn't help thinking that there is a lot of discipline at work there. This thin document is actually very deceptive – it's thin but it's

not slight. There are a lot of things that seem to be said between the lines. It looks like a lot of work has gone into it. I was interested to know, how conscious was the decision to make it relatively easy to read and not too elaborated?

Daryl: It was very conscious, and I suppose it's only fair to say that it was created only after I had created a mammoth – a gargantuan – introductory course I had taught before it. That one was an attempt to prove that we could use The Open University approach at our college. We provided bulk content from a variety of different sources. We created an introductory sociology course which in many ways was a sound course, but most students would have trouble embracing all the printed material that was sent to them. It didn't all arrive on their doorstep the first day. They got 10 quite thick books, some of which had 80–90 pages. They got 11 or 12 readers, some of which were 250 pages.

Rob: So A Sociology of Educating is nouvelle cuisine, in the sense that Malcolm Bradbury (1987) uses the term in his book *Mensonge.*

Daryl: Yes, though I suppose also there's a 'horses for courses' attitude at work. I would say the other approach is defensible because we were trying to establish people in a sociological career; if you like, to give them a library as much as anything else to establish them. A Sociology of Educating is a different course; it's a boutique product. I was driven to some extent by the criticism that's been evident in Australian distance education that we are always re-inventing wheels, the 'not invented here' syndrome. I thought I should either write a textbook like Roland Meighan, Lois Foster or the Easthopes and Rupert Maclean had done, or if I couldn't be bothered doing that, I should take what they provided in the public domain and guide students' engagement with it. That was what I was attempting to do.

Rob: One of the other things that intrigues me about your study guide, the word that comes to mind is 'voice'. Despite your interest in deconstructionism, reading it, there seems to be a voice behind the text. Was that a thing you consciously wanted to do? There's a sense that somebody is writing it. It's not disembodied text!

Daryl: Well some would say it is disembodied text. Yes, it is conscious. It's an attempt to create voices, rather than one voice, that literally presented itself while working on a Macintosh computer. I suppose a number of things converged fortuitously. The teacher in print traditionally has one voice, but there were a number of voices in the drafts I was composing as I went about creating the study guide. The convention is to convert the several voices into the one author, if you like, the authority. It occurred to me that the teacher in the classroom uses more than one voice: there's the authoritative lecturer, there is the tutor struggling to create discussion, there's the intellectual wondering aloud, the lecturer translating academic discourse into everyday language, and the helpful teacher/counsellor. Why couldn't all these teachers' voices be present in printed and audio teaching texts? After all, I had played all of these teacher roles in my classroom teaching. I think I had even gone part of the way in print in previous courses. For example, you always try to be encouraging in a newsletter that tells students about a change in assignments, and I had put a series of 'personal reflections' on my life experiences into an introductory sociology course. But the text in A Sociology of Educating was more radically deconstructive of conventional distance education texts than anything I'd done previously. Important influences were both the practical and theoretical work of novelists, critics and social scientists such as David Lodge, Ann Oakley, Malcolm Bradbury, Jane Lazarre, Clive James and Raymond Williams. Another significant influence was years of interaction with the graphic designer, Norman Hurrell. Our shared viewing and reading of Robert Hughes's *The Shock of the New* was probably very influential.

Rob: You're interested in the symmetry between the textbook and the voice of the textbook writer and I liked your story about Bernstein in the introductory audiotape – where you say that students of an earlier course understood his sociology better after you'd read them a piece in which he talked about the personal circumstances which had sparked his research work. They responded to the person, but found it difficult to respond to the person as conveyed by an academic text. I just wondered what the implication of that was for writing the course guide of A Sociology of Educating. It would seem

to say: 'That as well as writing the course guide, I've also got to make the tape of me writing the course guide.'
I thought you managed to convey that feeling in the text: it was written by someone.

Daryl: I think you're right when you implied that this kind of writing has to be executed carefully. The thing that has interested me is the students' reactions to these texts. There's been very little independent evaluation of the course because it's such a small course in our terms that we really could not justify having anything other than an 'off the shelf' evaluation. That survey simply told us that the students rated most aspects of the course very highly, but it told us nothing about the students' use of the teaching texts. However, we know about students' responses from what they tell us and from their responses to the assessment tasks. The stylistics have been almost universally unremarkable: the students have just accepted them as 'this is just what our teacher's like'. They have been unremarkable in two senses: no one has attempted to emulate the teacher and very few people wish to discuss the issue. This even applies to questions of clarification. I was surprised that there were no students saying: 'Well look, I can't understand these pages'. When there were any questions of information, they were the usual ones: 'what do you mean when you say such and such in the assessment section?', or people just saying 'this is what I propose to do, is it O.K?' Well that's what the assessment section asks them to do. I was surprised that there was less contention about the textual style and I used to worry about this for a while.

Rob: Were you consciously trying to model some contemporary requirements of teachers? I'm thinking of the new Victorian Certificate of Education, for instance?

Daryl: Yes, I was. Certainly I was trying to show people that it is possible for teaching and learning to occur these ways.

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Let's continue these themes by taking you back to an issue we touched on at the beginning. In developing your course did you choose to ignore the problem of what constitutes the classroom at a distance?

Rob: I didn't see it as significant then as I do now. That is partly a result the input that Helen brought to the course and it's partly due to changes in the types of students doing the course. We have increasing numbers of students who challenge the assumption of the centrality of the school classroom because of their own situations. They could be teachers who are not presently working in schools, nurses or people working in industrial training.

Daryl: Was the course created for classroom teachers?

Rob: Yes, the previous version was not only created for classroom teachers it actually discriminated against those who weren't. I taught the previous course for three years before I changed it and that was one of the things of which I became more and more conscious. The course would say: 'now go and do this in your classroom'. Yet up to a third of the people in the course weren't in a position to carry that out. In fact, one of the origins of the videotape was an attempt to provide a surrogate classroom for those not actually teaching in a school. And the same with the case study: 'you might not be in a school at the present time, but here is a surrogate school'.

Daryl: Was the video attempting to create a series of exercises in which students could see a variety of different teaching and learning situations which they could compare to those they had been involved in?

Rob: Perhaps that was part of it, but it was much more me playing around. I had never done anything like this before and I was beginning to get interested in the potential of interactive video. So I used the course to learn the skills I thought I would need to work in that kind of environment. I was consciously making myself do things like the two minute talk to the camera without any visuals, or the documentary segment where I go out with an architect and look around a school, or the more observational cinema styles of the lesson extracts. I was saying to myself: 'if I'm serious about

distance education these are the things I'm going to have to learn to do'. Also, I was attempting to learn about audio and especially to learn to use audio interviews that could be part of the course. Some of the things I've done on radio recently aren't part of the course, but they grew out of it. I was writing too in a way I hadn't written before; I looked on Classroom Processes as an apprentice piece. It was a chance to practise, to develop competence and to develop my proficiency as a distance educator.

An interlude: beyond instructional industrialism

Evans and Nation (1989) employed the term 'instructional industrialism' as a descriptor for forms of distance education which use a highly centralised organisational structure to produce and distribute teaching materials to large numbers of students. Such systems produce their teaching materials through course teams with a specialised division of labour employing subject matter specialists, instructional designers and publishing house methods of production. Central to this approach are philosophies, theories and educational practices which regard teaching as an 'expert' process which controls learners' behaviour and rigorously ensures their 'mastery' of a defined set of knowledge.

Whether or not this approach is ever fully achievable is an interesting question which has concerned theorists, researchers and practitioners. Certainly it is under challenge (see for example, Evans and King, 1991; Evans and Nation, 1989). Rob Walker and Daryl Nation have thrown out a specific challenge: they have attempted to create courses and teaching materials which teach students how to learn, rather than requiring them to understand a structured body of knowledge. They have adopted broader versions of project based learning similar to those advocated by Morgan (1976; 1983). They have attempted to avoid the problem, indentified by Evans (1989) and Thorpe (1979), of sets of teaching materials masquerading as courses.

In this regard the conversation represented above does not provide a substantial basis upon which to judge the pedagogical success of Classroom Processes or A Sociology of Educating, although some useful information relating to students' responses to Classroom Processes is available. (Altrichter, Evans and Morgan, 1991) However the conversation does provide

detailed understanding of the principles and practices employed by Daryl and Rob. It should be most useful to those who have made a commitment to explore the possibilities of similar approaches.

We now return to the dialogue, heading towards a consideration of the roles played by course developers and instructional designers in their work.

Is this course development?

Daryl: I'd assumed that Rob Walker had decades of experience in materials based learning. He's a curriculum expert, I thought. He knows all about these things and he is taking the opportunity to implement them. Are you saying: 'that's all wrong, it's a misconception'?

Rob: That is a misconception, yes. If anything, here was I, having spent many years as an evaluator of curriculum projects, finally at this late stage of my career being given the opportunity to actually do something myself. This was my curriculum development project! I had watched Nuffield Science, I had watched Stenhouse with the Humanities Project and I studied people doing other things; but, I'd never actually been in the creative role myself; I'd always been the outsider, the evaluator or the researcher. So I think that was the sentiment behind the quote from the video that you gave earlier: I spent years doing all this research and this is the best thing I've ever done. I really did feel this was my opportunity to do the work I'd watched other people do. Does that make sense? It seems to me that you're the person with all that accumulated experience. You described before how A Sociology of Educating was a slimmed down version – a kind of extracting the essence – of a previous course. Were you more consciously operating from the experience of having done similar or the same things before?

Daryl: Yes, that may be true. But I'd like to respond by making an observation and a confession. In my contemporary working life within Monash University, I encounter many explicit critics of and resisters to distance education. I have to try and convince them to be involved in distance education, or on other occasions to defuse their criticism. Obviously I can

do this on the basis of the experience you refer to. Yet I feel that if I hadn't been in a position where I was required to practise distance education, I could have been a critic myself, possibly the type of unthinking critic who says: 'the very best education only occurs in small groups, where people know and understand each other' – the view that the mythical postgraduate seminar constitutes the very best in the university experience. I had always espoused those ideas. I've always thought that the well organised classroom is where teaching and learning occurs most effectively. And it's been that philosophy, and a degree of training that's gone with it, that has driven my teaching at a distance because I think most good teachers just do what they think's necessary to get ideas across to their students. If there is a fordigraph lying around they'll start using it. Once Macintosh computers arrive they start using them. Simply, all I have done is use the available tools and drive them as hard as possible, just because it's good fun and it helps people to learn.

Rob: I'm sure I shared those assumptions about the essential nature of teaching as being somehow located in face-to-face interaction in a group. I think one of the things I've also learned from Classroom Processes is that those assumptions relate to a definition of teaching and not a definition of learning; things look very different from the student's point of view. It was quite a shock for me to realise after all those years of classroom teaching, especially in postgraduate seminars, just how coercive group interaction can be for individuals and how intimidating it can be. There was a real sense of liberation for me in my first contact with distance students, for I found myself having quite intimate conversations with people, either on the phone or through writing, and I realised I'd never really had that sort of teacher contact with students in university research seminars. Distance teaching, for me, works at a different and higher level of quality to conventional teaching.

Daryl: Another irony for me is that I went into teaching because I thought I wouldn't have to write much. I thought that this is something an educated person could do without having to write too much. I was going to be a secondary school teacher: I would do the talking and the students would do

the writing. Yet here I am today in a trade that is all about writing, but writing in the sense of Hollywood or the media, rather than conventional academic writing. I think there is another set of interferences. In universities we have to teach students the academic approach, but academic discourse is not the only form of discourse that is necessary when introducing students to academic knowledge. In the classroom context a lot of those things are taken for granted or only partly acknowledged. In distance education we have recognised that a new set of conventions needs to be created, to carry this out.

Rob: I think that partially explains the resistance you talked about earlier when you were talking about the academics who think distance education is an intrusion into scholarship. One of the things I feel pangs of guilt about is that Classroom Processes does occasionally undermine the attempts that students make to get into the academic style of writing. I actually don't like it very much. I prefer much more personal forms of writing, I find it more interesting to read, but I realise that for a lot of students that's what they want to learn to do and maybe need to learn to do. Perhaps they need to go through a phase where they learn the academic style and work back to the more personal. It's a point of tension between Helen and myself. Helen is better at helping people to learn those academic conventions.

Daryl: My experience suggests that the academic conventions are so strong that students don't jettison them simply because the teaching texts with which they engage are written in different styles. The fine print in my course does not say: 'provide an academic product'. It says: 'if you wish, provide us with an academic product'. All but a tiny minority provide fairly conventional work, the standard academic essay is the common response. The opportunity that's available in the course for students to have an oral exchange with a tutor, the so called Accumulating Tests, is the context in which discourse is most personal. They're much more likely to relate personal and professional knowledge to sociological theory in those circumstances. I teach another course which is rather like some of those Helen Modra has been involved with, where students are obliged to reflect in terms of personal experience; they are able to do that as well as provide an academic essay. For many, while they could

have intruded themselves personally all the way through their responses to that course, they only do it in the one assignment where it is required; where they can voluntarily elect to do otherwise it's often missing. This is despite the approach modelled by the teacher in the course materials.

Rob: I like the idea of students choosing the level of difficulty they want to attempt, like competition divers and gymnasts, but in Classroom Processes we take a much more aggressive line. You can't work through those first 60 odd tasks in Classroom Processes and sustain those assumptions about academic writing. Some people start out trying to do it, but you just can't do it in the time available. Things are coming at you so fast, you just get one down and you're off in another direction and it comes at you from somewhere else, the demands on you are so great that it disrupts all those expectations. So I think we've succeeded in deskilling people in terms of the feeling that they have to respond in academic terms. It may return in some of the later assignments that are more conventional, but not for many. The majority of people, having been through that initiation phase, are disabused of the assumption that they have to write in a conventional academic form, to the point where we've dispensed with the School of Education's style guide for assignment writing because it was creating such contradictions for the students.

Daryl: Have you attempted to convince your colleagues to practise these sorts of things?

Rob: It's never been a priority for me. I've never particularly wanted to because I think the strength of the degree lies in the diversity of its units, but it's begun to happen in that one of the units that runs parallel to Classroom Processes is a similar two unit course in curriculum which has been rewritten recently. Ron Lewis chairs that course team and they have picked up a lot from our approach and adapted it for their purposes. It will be interesting to see how it works out in practice. These two units, Classroom Processes and Changing Curriculum, constitute a half of the final year of study in the BEd degree. Many other staff have been interested in how to use the visual material, both the still photos and the video. Many have picked up on the surfaces of the course, but I don't think many have really

picked up on the deep structure and the sorts of things we've been talking about today.

Daryl: You've just reminded me that this discussion will ultimately end up in a book dealing with instructional design and course development. What influence have course developers and instructional designers had on you?

Rob: I would think it's more negative than positive. I operate to some extent with a stereotypical view of instructional designers/course developers and react against it; but that's to react against a very narrow definition of instructional design or objectives based models and so on. I don't actually know what the real influences were in determining the structure of Classroom Processes. I can't help thinking that if we had a competent instructional designer we wouldn't have done the things that have turned out to be most successful in the course. We had a very experienced course developer in the early stages who kept saying: 'you can't do that, the students won't understand, you can't do that, it's not going to work'.

Daryl: Was it useful to have those suggestions?

Rob: Yes it was for a short time, but it actually made me more determined to do things my way. I think if she'd stayed I would have found it sapping my confidence after a while because I knew I was operating in the dark and to have someone who'd been working in distance education for 10 years saying: 'if you do that it'll be a disaster', I would have compromised a lot of things that I'm glad now I didn't because I think the course has been vindicated by its students. There are still things wrong with it, there are still deep problems that I'm very conscious of, but I don't think an instructional designer would have helped. The people who did exert important influences were incredibly helpful, and without them it wouldn't have happened at all. We were very lucky to be assigned an excellent text editor in Fiona Henderson. She not only had a sound intuitive understanding for what we were attempting, but threw herself behind it and made the thing work. I think if she hadn't done that, if she'd played her role straight, it would have been a really messy outcome. There would have

been a lot more wrong with the course and she takes the credit for the fact that students find most of it accessible and user friendly.

Daryl: Did the editor influence the integration between audio, print and video?

Rob: Yes, at the end Fiona was the only person who understood how the video, the audio and the printed text fitted together. She understood this better than I did. In a lot of these things the process appears to be linear but as you know, when you come to put the pieces together it isn't actually made like that. Especially as we had to write the text first and to make the video afterwards, guessing at what would be on the video and then when we came to try and make things happen on the video they didn't always work. But we had other bits of video that did work, so we had to go back and cut things out of the printed text or revise them and rewrite them. When I say we, it was mainly me but I couldn't have done this without being able to call on the judgment of the editor. Which I think raises another question. I have talked a lot about course teams but I think this course, and certainly its first section, really could have only been written by one person. It needed the roles of writer and editor which Fiona and I managed to work out between us, working pretty closely together. I think if it had been a conventional Deakin course team, it wouldn't have worked out quite the same way.

Daryl: My experiences have been somewhat similar to yours. I have had some very constructive advice from people who could be called mainstream instructional designers or educational technologists. Fred Lockwood, from The Open University, gave me immense practical assistance in the early development of the introductory sociology course to which I referred earlier. Everyone who has helped me has understood who I am or what I stand for and has tailored things to suit me. For example, if you give Fred a proposed textbook to read, he comes back and says: 'this is how I think hypothetical students will read it'. I've had very constructive advice about whether or not someone without much background in sociology could read something that I've been assuming they can read, from the perspective of

a practising sociologist. Instructional designers have been very helpful in those instances and as sounding boards relating to course structure and student assessment.

However I think the most constructive advice I've had to assist with teaching at a distance has come from graphic designers and television and audio producers, who simply say things such as: 'where's the vision?'. You have all these ideas on paper and in your head and the question: 'where's the vision?' is put by an editor/producer; you say here it is, you blurt out a response and they say: 'it won't work', and give compelling reasons as to why. These experiences started me reading about the film and television industry and how it works. In that industry there tends to be always one person's ideas dominating what eventually becomes the film or the series and it's not always the director or producer – it can be a writer. The guide books on screenwriting have influenced me significantly. The trouble with film and television people is that they lose interest once the product is in the can and it is starting to be marketed, whereas that is really only part of the job from a teacher's point of view.

Rob: We were very lucky with the video producer in that he was interested in the ideas and came a long way in thinking through the course with us. As you were talking I was thinking it's not an accident that Fiona had been a journalist before she came here. Therefore she had that sense of what you could say in three paragraphs, and if you say one thing here and one thing there the students are going to get confused. So I relied on her a lot for advice, I'd say – 'If we put that section there and that section there, what do you think the students are going to make of it? Will this be just confusing? Is there a better way of saying these things? or should all that section be taken out?' It wasn't just a question of picking up on the grammar, it was much higher up the taxonomy and I think it demanded a real understanding of what the course was about. You can't do that kind of work unless you have a grip of the ideas. I think she had a bigger impact on the course than probably any other individual because of that. Although she didn't actually write any of it, what finally came out on the page and in the video was as a result of that process.

Daryl: And it's a journalist or an audio technician or producer who will finally convince you that, for example, it is possible and sensible to make an audio recording of an interview with the authors of textbooks. They're the people to whom I would appeal when looking for support against academic peers who just can't conceive that you would do that. For instance, it's often suggested that it's alright for academics to talk about their work on the radio, but you don't do that sort of thing in a course. There are even academics who have hinted to me: 'this is not the done thing, people don't talk about their books'. Yet I have not been refused by any academic author who I have asked to talk about their work for an audiotape.

Rob: That's what I really do not understand about that resistance you reported from academics. In some ways I don't want word to get around because all these wonderful resources are available; there's a whole publishing industry here, with our own graphic designers and editors. It is not like working with a commercial publisher where you hand over the manuscript and never see it again. Here you can sit with the editor and talk with the designer, you can change your mind. As well we have a television studio and a recording studio, things that most people would give their eye teeth for and it's just here. You just have to go and talk to people and they'll say: 'yeah of course we'll do it. What would you like to do next?' I was just amazed that these resources are really underused, not so much in financial terms but in educational terms. What was most encouraging about doing this course was not so much the response of other academics who said, 'now you've done it, we want to do it', it was much more the video producer who almost every time he sees me says 'what are you going to do next?' He's genuinely looking forward to doing something a bit different and it's the same with the text and graphic design people because most of what they do on a day-to-day basis is pasting up slabs of text. Most of what the video people were doing was making endless three minute snatches of instructional exercises. The chance to get out and do hand-held camera work around a school or to spend an afternoon in a studio working out different possibilities for trying to get something down on tape are more challenging. I think the video people felt a sense of confidence that they actually had something to contribute: 'Why don't we put

a little inset in the corner? For this bit we could cut the sound'. All these things that they know about, but normally we just don't give them the scope to do. For academics and teachers to have those resources sitting around and not to use them is stupid. And yet most people don't want to do it. I don't understand it.

Daryl: Neither do I, but I'm sure we shouldn't make it compulsory.

Rob: Keep it quiet though, don't let anyone else in on the secret.

Course development as a partnership

This will not be a discussion of the nature of course development or instructional design. But it is worth drawing attention to the fact that both participants in the conversation above see themselves as course developers, notwithstanding the fact that they are both academic staff – 'subject matter specialists' as they are sometimes called by course developers – in universities which employ specialist course developers. While each regards himself as having substantial responsibility for course design and development, it is also significant that each has worked with a range of professional colleagues to accomplish their educational goals. They both value the diversity of ideas available to them in creating their courses.

Superficially, it could be tempting to dismiss their principles and practices as atypical of teaching staff in universities teaching at a distance. They are both professionally experienced as teachers; they both have qualifications in education and they have taught and researched in schools. Most academic staff in universities do not have such qualifications or experience although all but the novices and backroom boffins have considerable experience of teaching albeit often in a narrow subject field. Universities involved with distance education and open learning often encourage or expect such staff to work with professional course developers or instructional designers when designing courses or preparing teaching materials.

Nation and Walker have rejected the typical attitudes of teaching staff in universities teaching at a distance, whereby the knowledge of instructional designers and course developers is either accepted uncritically or, as is most likely, ignored. They practise theories which regard a distinction between subject matter (content) and teaching (method) as of limited value. Disciplines should be

about their practitioners informing others of their knowledge. These communication processes should be an important part of the discipline. Certainly, informing students of the discipline should be one of the major tasks. Conventional academic publications only communicate with a narrow range of specialists and their style should not guide communication with students and the public. Going beyond academic discourse is both important and difficult; it requires skills which are not usually offered as part of the induction into a discipline. There are, of course, obvious exceptions in parts of disciplines such as communications, education and marketing and in the work of the 'TV scientists' such as Jacob Bronowski and David Suzuki.

Walker and Nation believe that instructional designers and course developers can provide teachers with useful knowledge to improve their effectiveness in distance education, but not in an inflexible system which mechanistically allocates these services to the teaching staff. A more effective environment recognises that there are many professional callings (even trades) which can contribute valuable knowledge in this regard. This sharing of expertise is best carried out in a flexible system which encourages teamwork.

Another essential task is to change the organisation of disciplines so that all forms of teaching and communication with 'non-experts' become an integral part of the discipline. This could be achieved by increasing the value placed upon publications developed for teaching and public education. The teaching materials employed in distance education offer considerable advantages in this regard, especially when compared to the somewhat intangible methods of classroom teaching.

If teachers are to work in a partnership with editors, audiovisual specialists, computer programmers, instructional designers and course developers, it essential to have an organisational structure which is flexible enough to allow course teams to convene on a truly collegial basis. These processes are inhibited by academic staff who are not prepared to engage constructively with professional colleagues with expertise in communications and teaching. The obverse tendency exhibited by some course developers and instructional designers should also be avoided, whereby academic staff are assumed to have no interest or expertise in communications and teaching. There is a pressing need for more critically reflective debate among all the potential partners in these endeavours.

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CHAPTER 7

Materials production through 'on the job' training: a case study

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The following account of the rapid production of a low resource, self-instructional training package commences with a brief description of the background to the project and the training needs assessment that contributed to it. However, the main focus of the account is the working assumptions that were identified and upon which planning and production were based, and their implications for the production schedule. Various comments by the authors of the training package, obtained on reflection, are used to support or challenge the working assumptions and may prove to be salutary for those considering a comparable production method. Comments were obtained from self-recorded audiotapes in response to written questions (Lockwood, 1989, 1991, 1991a) posed one year after the final manuscript was handed over to the editor.

Background to the project

The National Association of Clinical Tutors (NACT) was formed in 1969 to assist tutors in their role as leaders in district medical education. It has arranged and promoted a number of courses for the training and continuing professional development of clinical tutors, the most successful being the 'Nuts and Bolts' course (National Association of Clinical Tutors, 1986) that was presented twice yearly for approximately 50 new tutors on each occasion. In 1987 the NACT supplemented this course by assembling the NACT Tutor Handbook, a collection of commissioned and previously published articles relevant to a range of activities involving clinical tutors; it provided a valuable resource.

During 1987 the NACT Advisory Council noted that the roles and tasks of clinical tutors were undergoing considerable change as a result of initiatives from tutors themselves (National Association of Clinical Tutors, 1986a), from centrally organised developments such as 'Achieving a Balance' (UK Health Departments, 1987), and from General Medical Council recommendations on general clinical training (General Medical Council, 1987) and specialist training (General Medical Council, 1987a). The ability of the NACT to meet the needs of approximately 300 clinical tutors in posts within the UK, and the 75–100 each year who would be taking over the duties of retiring tutors was being strained.

Training needs assessment

In 1988 a training needs assessment was undertaken on behalf of NACT in relation to clinical tutors' training needs. It involved 23 new and experienced tutors who were interviewed about a range of issues concerning a possible training package. These included:

- content and possible structure of the package;
- preferred teaching methods;
- whether the same training material was needed for new as opposed to experienced tutors;
- how much time would be required to study such a package.

The training needs assessment identified a wide range of topics for potential inclusion. These were grouped into nine broad areas, for example *Finance* in which 'budgeting' was identified, *Educational Methods* in which 'small group work' was identified and *Educational Theory* in which 'educational change' was identified. Tutors were asked, without prompts or suggestions, what learning methods they would prefer. Two were seen as most popular: regional local meetings and a distance learning package. The training needs assessment also revealed that despite the tutors' wide range of experience (from none to more than three years), there was broad agreement that a single training package could suffice. The time tutors were prepared to devote to study varied considerably also: from none to two hours per month and from 2 days to 10 days per year.

The findings from the training needs assessment prompted a proposal from the NACT to the Department of Health for a distance learning package representing 14 hours of study time focusing on the

topics identified and those which could satisfy the needs of both new and experienced tutors. (While regional/local meetings were popular it was estimated that tutors risked spending longer to travel to meetings than actually engaging in training activities! A distance learning package would allow them to study selected topics at a time, place and pace of their choice.) The proposal was accepted by the Department of Health in April 1989 and a team was formed to assemble the training package. The timescale, from commencement to the production of printed training package was planned for 21 months (Grant and Marsden, 1988) with material to be available for study on August 29 1990.

The course team

A team of six individuals was assembled. It consisted of four medical representatives who had considerable experience as clinical tutors but none of writing self-instructional material. When the four authors were asked: "What previous experience have you, if any, of writing self-instructional training material; material that could be studied at a distance?" their self-recorded comments indicated:

> *. . . no experience at all . . . absolutely none whatsoever . . . none at all.*

The team was supported by an educational technologist, with considerable experience in producing self-instructional material but no medical background, and a representative from the Joint Centre for Educational Research and Development in Medicine to advise the team and to provide liaison with the Department of Health. The educational technologist was to act as course team chairman, coordinating planning and production of the package. The four medical representatives were to draft the training material. Production of the package was a low resource project. The medical representatives were unpaid and agreed to produce the required materials in their own time; they were not relieved from other duties or responsibilities. When asked: "Prior to the first meeting of the NACT team, what were the fears, anxieties or concerns, if any, that you had about your involvement in the project?", their self-recorded comments focused on the time demands likely to be involved:

> *My only anxiety was that it could be very time consuming...*
> *I was intrigued by the prospect of writing self-instructional material and just hoped I could fit it into all the other things I was doing.*

The educational technologist was employed three-fifths time on the project and the Joint Centre for Educational Research and Development in Medicine liaison person one-tenth time; a project secretary was employed two-fifths time.

The first course team meeting on July 24 1989 provided the first opportunity to collectively review the training needs assessment report, consider the content and structure of the envisaged NACT package and the schedule for its production. A year later the authors were asked: "To what extent did the following increase or defuse any fears, anxieties or concerns you may have had?"

(a) Findings from the training needs assessment
(b) Production schedules for the package
(c) Manner in which the first meeting was conducted.

Self-recorded replies to question (a) revealed differences of opinion, which from memory did not emerge in actual discussion. The majority of the authors considered the training needs assessment:

> *... an extremely useful exercise and [it] really is a prerequisite to any such venture that anyone might want to conduct on similar lines in future ... it provided valuable insights into the training tutors wanted and how they wanted to receive it.*

In contrast, one author:

> *... did not believe that this was a very adequate analysis of the major needs ... rather an expression of relatively superficial ways tutors [perceived] their role.*

However, apart from the personal experience of the authors it was the only evidence available and was used to structure the training material.

Authors' recorded comments to question (b) revealed unanimous agreement but one that did little to defuse the anxieties expressed in response to the previous question. When the proposed training package schedule was outlined (see below) it stunned several of the authors.

... the production schedule for the package filled me with trepidation ... It was good to have deadlines ... you cannot survive without them [but] it was a crowded schedule and did impinge on other things ... As the schedule was revealed I remember getting more and more anxious ... I could see the need for a tight schedule but wondered if I would be able to meet it.

The responses to question (c) revealed that the manner in which the first meeting was conducted did succeed in conveying a sense of competence, confidence and reassurance that advice and assistance would be available throughout. An author remarked that his concern was substantially reduced:

... by the manner in which the first meeting was conducted ... I remember feeling relieved by the professional and confident approach [the educational technologist] conveyed ... In the end I began to think the team probably could do it.

Timescale and working assumptions

The project proposal submitted to the Department of Health indicated a 21 months schedule which included three months for the training needs assessment. However, the period between the first team meeting and target date for the study of any resultant materials (August 29 1990) was only 13 months! Furthermore, OU experience indicated that this schedule would be reduced further when time was allocated for associated print production tasks. Working assumptions were:

- that the various manuscripts produced by team members would benefit from the process of professional editing; that it would ensure a consistency of style and uniformity of typographical presentation;
- that the layout and design of the package would benefit from the input of a graphic designer; that advice and assistance on page layouts, use of icons, typefaces, running heads etc. would improve its accessibility. Limited funds had been allocated for these tasks and an estimate of eight weeks was considered realistic for them to be completed on a part-time basis;
- that a commercial printer would be employed to print, collate, bind and package the material. Previous experience of working with commercial printers suggested that 14 weeks should be allocated for this phase;

- that the NACT Advisory Committee should be given the opportunity to inspect the final version of the package prior to printing; a two week period for this task was considered reasonable.

When these time allocations were superimposed on the schedule, the period actually available for assembling the package was not 13 months but *six and a half* (see Table 1).

Table 1
Provisional course schedule

Date of course team meeting	Period for materials production	Deadline (arrive OU)	Turnaround time
24.7.1989			
7.2.1990	H/O (1 week)	14.2.1990	1 wk
(21.2.1990)	Advisory Committee approval (2 weeks)	7.3.1990	1 wk
(14.3.1990)	Editing and design (8 weeks)	9.5.1990	1 wk
(16.5.1990)	Printing, binding, packaging handling (14 weeks)	22.8.1990	1 wk
(29.8.1990)	Clinical tutors study material		

Other working assumptions were:

- that the initial writing and refinement of the training materials would be undertaken through a series of drafts. Previous OU experience with similar training materials, and with authors working in isolation between course team meetings suggested that a brief synopsis (D0) followed by three drafts (D1, D2, D3) prior to the production of the *handover* version (H/O) manuscript was likely to be necessary;

- that although the training material would have been written by experienced tutors, to meet the specified training needs of colleagues, it would be prudent to try out or developmentally test (DT) the material with a small sample of tutors prior to finalising the H/O manuscript.

Provisional estimates of the time available to assemble the synopsis and series of drafts, and to test the materials were superimposed on Table 1 and are represented as Table 2.

Table 2
Revised provisional course schedule

Date of course team meeting	Period for materials production	Deadline (arrive OU)	Turnaround time
24.7.1989	DO (5 weeks)	30.8.1989	1 wk
6.9.1989	D1 (3 weeks)	27.9.1989	1 wk
9.10.1989	D2 (4 weeks)	8.11.1989	1 wk
15.11.1989	DT (1 + 4 weeks)	20.12.1989	2 wks
3.1.1990	D3 (4 weeks)	31.1.1990	1 wk
7.2.1990	H/O (1 week)	14.2.1990	1 wk
(21.2.1990)	Advisory Committee approval (2 weeks)	7.3.1990	1 wk
(14.3.1990	Editing and design (8 weeks)	9.5.1990	1 wk
(16.5.1990)	Printing, binding, packaging, handling (14 weeks)	22.8.1990	1 wk
(29.8.1990)	Clinical tutors study material		

The final working assumption was:

- that course team members would value advice and assistance on how to write self-instructional material and the processes involved in production. However, the production schedule was so demanding that valuable time could not be devoted to an appropriate induction course. An alternative was to identify a restricted series of seminars and workshops that could be conducted at the time of course team meetings. These would equip members with the necessary skills and techniques and an awareness of factors to consider during decision-making. The team unanimously accepted these 'briefing and training' sessions which were integrated into the schedule (see Table 3).

For example, two workshops were conducted during the first team meeting: 'Course concept map(s)' and 'Clinical tutor workload'. The first was designed to enable team members to prepare a concept map which would be a major feature of a synopsis of the training module. The second alerted them to the study time that training materials would consume, thus providing guidelines for subsequent drafting. Other seminars/workshops were designed to focus on key skills or techniques they would need during package production.

When authors were asked: "How successful do you regard the briefing and training sessions that were mounted alongside team meetings in helping you to assemble self-instructional material?", their replies were wholly favourable – even complimentary:

> *... briefings were essential because none of us had experience in this kind of activity ... on thinking about it, it might have been better to have a little more ...*

> *... The briefing and training seminars made me realise just what was involved in designing and writing the materials ... without them we would have struggled and probably not succeeded ... these were valuable in that they demonstrated the very real competence of the OU setup at delivering distance learning packages and half convinced one that [this] experience was so soundly based that if there was a clash of opinions [the educational technologist was] likely to be right.*

Table 3
Course schedule – production, briefing and training

Date of course team meeting	Period for materials production	Deadline (arrive OU)	Turn-around time
24.7.1989 Course concept map(s), Clinical tutor workload	DO (5 weeks)	30.8.1989	1 wk
6.9.1989 Aims and objectives, Learning activities, Characteristics of self-instructional material, (audiovisual media)	D1 (3 weeks)	27.8.1989	1 wk
9.10.1989 Developmental testing, Layout and design	D2 (4 weeks)	8.11.1989	1 wk
15.11.1989 Clinical tutor support	DT (1 + 4 weeks)	20.12.1989	2 wks
3.1.1990 Course evaluation	D3 (4 weeks)	31.1.1990	1 wk
7.2.1990	H/O (1 week)	14.2.1990	1 wk
(21.2.1990)	Advisory Committee approval (2 weeks)	7.3.1990	1 wk
(14.3.1990)	Editing and design (8 weeks)	9.5.1990	1 wk
(16.5.1990)	Printing, binding, packaging, handling (14 weeks)	22.8.1990	1 wk
(29.8.1990)	Clinical tutors study material		

Structure of the training package

A major problem was to identify a course structure that would appeal to both experienced and inexperienced tutors, recognising their different backgrounds and needs. An early decision was taken to design the package as a resource that tutors could draw upon as required, thus exploiting a major benefit of self-instructional material: tutors could study at their own pace, time and place. The training needs assessment had identified nine broad areas which, through discussion, were conflated into four coherent topics. Within each topic core issues were identified as critical to any training package, whether tutors were experienced or not. Related topics of potential interest but which could be regarded as optional were also to be offered. The main structure of the package was thus based on four core modules and eight optional modules – two to each core (see Figure 1).

The original training package proposal had suggested a project component. An initial suggestion was that a worthwhile product could be a fully documented Postgraduate Medical Centre activity - one that could be actually mounted as a result of working through the NACT training package. Such an activity could be developed through a series of stages with material in each of the modules contributing to a stage in its development. Furthermore, it was speculated that if each tutor was to document a worthwhile Postgraduate Medical Centre activity and place this within a 'NACT Activity Bank', other tutors could draw upon them. The project would allow each tutor to assemble one activity but have access to several hundred others. Unfortunately scheduling and resource constraints rendered such a project impossible. The alternative was to collect information on issues within each of the four modules via a series of feedback forms, thus creating a national database for subsequent revision and expansion of the package (see Figure 1).

Alternative methods of writing and revising the training material were discussed, including the 'carousel system' of revision where each successive draft of a module is refined by a different author, the final handover draft being the product of the contributions and revisions from several different authors. However, the unanimous decision was for each of the four core modules, two associated optional modules and feedback forms to be the responsibility of a single author.

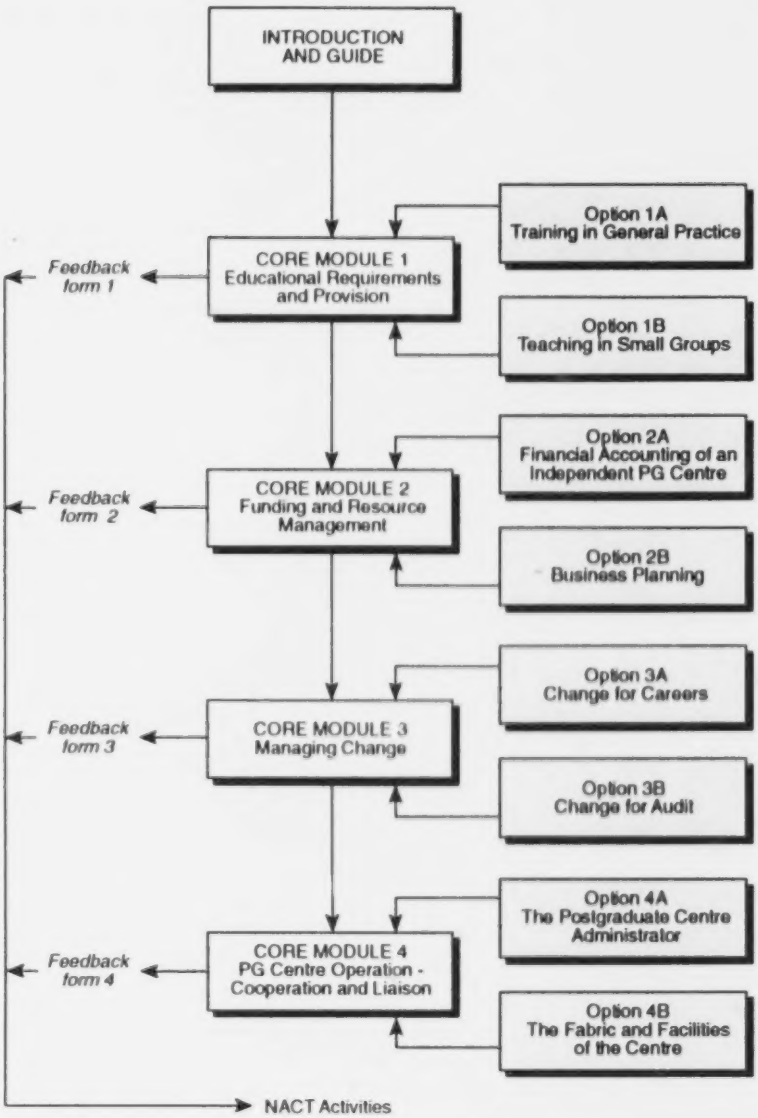
INTRODUCTION AND GUIDE
Option 1A Training in General Practice
CORE MODULE 1 Educational Requirements and Provision
Feedback form 1
Option 1B Teaching in Small Groups
Option 2A Financial Accounting of an Independent PG Centre
CORE MODULE 2 Funding and Resource Management
Feedback form 2
Option 2B Business Planning
Option 3A Change for Careers
CORE MODULE 3 Managing Change
Feedback form 3
Option 3B Change for Audit
Option 4A The Postgraduate Centre Administrator
CORE MODULE 4 PG Centre Operation - Cooperation and Liaison
Feedback form 4
Option 4B The Fabric and Facilities of the Centre
NACT Activities

Figure 1: Structure of the NACT training package

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The task of writing the material was an individual and team effort. If the whole package was to be coherent it demanded close consultation between team members and possible compromise, but with the bulk of the writing being completed individually. In response to the question: "During the process of assembling and revising your draft what were the pleasant and unpleasant experiences you had while (a) working on your own? (b) working in the small team?", authors revealed a series of personal reflections.

Undertaking individual writing tasks (typically for medical reports or published articles) was familiar, as was the experience of working in small groups, however none had worked together in a small team with collective responsibility for the eventual product. In this context the pleasant experiences were related to the productivity displayed by individuals, the mutual support and the feeling that it was a team effort.

> *... there was no 'dead wood' or 'free riders' on the project ... it [was] peculiar and unique to have each member of the team making a contribution ... I soon discovered that the others were trying to be constructive and to help me assemble the best possible draft ... there was a feeling that I had to deliver so as not to let the others down.*

However there were some unpleasant or unsettling consequences. The pressure to maintain the schedule put several authors under great personal strain especially when they were drafting material in a style completely foreign to them. Some were in senior positions within their profession and it had been many years since their writing had been publicly discussed and criticised.

> *... although I had considerable experience of writing for American journals ... the style and approach [demanded] was dramatically different ... it required a very major concession to adopt the team style ... feedback [from colleagues] on the shortcomings of the draft work ...was uncomfortable [since] it was quite a long time since one had experienced criticism and comments about one's work. Although justified ...it is not the most pleasant thing to happen.*

Conclusion

The NACT Training Package was assembled ahead of schedule and within the budget, and it met the training needs that had been identified. The exercise demonstrated that it was possible for a small group of medical specialists with no previous experience of writing self-instructional material, to be equipped with the necessary skills and techniques at the same time that materials were being produced. The product of the exercise was not only the training package; specialist medical staff had acquired valuable additional writing skills to be used in other projects at some future time.

In response to the question: "How satisfied were you with the final product - the bound and packaged version of the NACT training package?", authors' comments reveal unanimity in their satisfaction.

> *I thought the end product was very satisfactory ... significantly better than I had dared hope ... it came out very well... It was readable. It contained all the elements that we wanted it to contain ... it looked pretty good ... Considering the time we had available the quality of the package is something we have to be proud of.*

Authors were also aware of the writing skills they had acquired:

> *... knowing what I know now would make a similar project so much easier ... I believe I could fit in on a second occasion, God forbid, much more easily than I did initially ... The learning curve was quite steep at times ... but [I] am now far better equipped to do something like this than I was before.*

The training package was assembled at a time when the role of the clinical tutor was undergoing considerable change and when the National Health Service was under review. Recent changes in general medical practice education and operation of the Postgraduate Education Allowance are leading to a reassessment of the training needs of clinical tutors. Existing modules are being revised and the present training package is being added to. Face-to-face training activities, similar to those identified by clinical tutors in the training needs assessment, are also being mounted.

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CHAPTER 8

Creating a course on research in distance education

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Research has a revered position in the cultures of universities. The pursuit of knowledge and publishing its products are a major currency in academic life. In distance education the amount and range of research has been expanding in recent years as the field itself expands, and as its practitioners begin to see scholarship as a means of developing their work. A parallel development has been the emergence of award and non-award courses. Initially these were focused on basic practical aspects for novitiates in the field, but more recently they have developed to include the study of distance education as a field of enquiry in its own right.

We have been involved in one such course, the Master of Distance Education (MDEd) which has been jointly developed and taught by Deakin University and the University of South Australia (see Calvert, Evans and King, forthcoming). Our work has particularly focused on the development of one unit, *Research in Distance Education*, which is the final of eight coursework semester units taken before each student embarks on their minor thesis (equivalent to four semester units study).

In this chapter we discuss the issues we wrestled with during our conceptualisation of the unit and explore the processes involved in developing the course materials according to the plan we evolved. It is necessary to establish the context in which we were developing the unit before proceeding to our discussion of issues and processes.

The context

Our work on the *Research in Distance Education* unit reflects part of our contributions to the joint Deakin University and University of South Australia MDEd program. Staff involved in both universities form a large program group from which all the units are developed.

For each unit one person at each university is designated as chair and deputy chair of the course team. The chair is located in the university where the materials are to be physically produced and the deputy chair at the other institution. In the case of *Research in Distance Education,* Deakin was responsible for course materials production, therefore Terry Evans was the chair and Ted Nunan the deputy chair. However, for the 'intellectual' production of course materials the tasks are necessarily shared between course team members from both institutions. The MDEd course teams typically have between two and four (one has eight) contributing members, although occasionally other staff and consultants may be involved in reviewing and commenting on materials. We were the only two staff involved in contributing to course development of *Research in Distance Education*, although there were some contributions from three outside consultants.

Perhaps the most significant respect in which the MDEd is expected to distinguish itself from the Graduate Diploma course is in relation to the development and practice of students' capacities for research. Arguably, this is principally evident in the curriculum structure of *Research in Distance Education* and the minor thesis. Our experience on other Masters awards led us to appreciate that there are considerable difficulties involved in helping students to complete good quality theses. Some of these difficulties stemmed from the nature of research itself, the various types and levels of research experience students had, and the particular demands of a thesis. It was decided to make the thesis equivalent to four semester units (which would constitute the final year study for most part-time students) rather than two which was often the case at our universities. This would give students more scope to complete something worthwhile and of a good quality, and would reflect more accurately the amount of work involved.

A major concern of the MDEd program group was the need for adequate preparation and guidance in the students' research and writing. It was agreed that *Research in Distance Education* would be the principal means through which students would be prepared for their thesis and that, taken together, they would represent the major substance of the research preparation provided by the MDEd. This is not to deny that research and research-related activities do not extend throughout the MDEd, but it is to recognise that the curriculum of the final five semester units of the degree is concerned specifically with research practice. An important goal for coursework Masters degrees is usually that they provide students with opportunities

to develop their research experience sufficiently for them to enrol in research higher degrees, especially doctorates, in their area of specialism.

Given these broad research-oriented aims for the MDEd, we concluded that we needed to encompass three areas concerned with research in *Research in Distance Education.* Firstly, we needed to provide students with an overview of the major paradigms in educational, social and behavioural research within which forms of distance education research are located. Secondly, students needed to be apprised of some examples of contemporary research and research methods in distance education. Thirdly, the various aspects of research planning, implementation and presentation of findings needed to be covered. Clearly, *Research in Distance Education* could have taken any one of these three areas and virtually made a semester unit's work out of it. We had to make some strategic decisions if we were to cover the three areas satisfactorily within the scope of one unit.

One of the first things agreed was that we could not hope to teach the range of research methods which can be used in distance education research. The range of methods and the related statistical and computing skills required for some forms of research would be far too much to achieve. It was also considered unnecessary in that the students would be making their own selection from the range of methods and therefore would be disinterested in some. However we did want to provide some resources or details of potential resources in these areas, and we wanted to ensure that students were familiar with available research methods. One important matter we agreed upon was that this was a ***Research*** *in Distance Education* course and not ***Research Methods*** *in Distance Education.*

An important consideration for us was that the various forms of research in distance education which are extant in the field are framed, not only by the prevailing circumstances and institutional contexts, but also by the paradigmatic orientation adopted by the researchers. We decided that by introducing students, albeit briefly, to the paradigms which underpin various forms of research, we could use this work to inform a critical analysis of examples of different forms of research which would both reinforce the former and provide a framework for the latter. In addition these examples of research needed to include not just the findings themselves, as manifest in articles or research reports, but also information about the practical circumstances which surrounded the people who performed it.

This represents the transition from the presentation of examples of contemporary research into the final stage of the unit concerning planning, implementation and writing-up of research. We believed that introducing the students to the people behind particular research studies would help them see themselves as emergent researchers in the field who would also have to work within particular contexts and make decisions framed by their research paradigms, etc.

By the end of *Research in Distance Education* we wanted students to be able to plan a piece of research and to have considered all the matters reasonably expected to be included in a research application to a funding body such as the Australian Research Council (e.g. costs, schedules, ethics, literature review, research aims and means of communicating research findings). We believe that it is important to require students to develop a full research proposal as their final assignment and that this should be prepared with an actual piece of research in mind. This could be something they are proposing to do in their distance education contexts, or it could be for their final thesis. Choosing the latter meant the advantage of having a proposal which assists the transition to the final thesis year, especially as regards the students' reading and preparation, and our allocation of supervisors.

Developing Part One: introduction to research paradigms in distance education

There were a number of practical concerns in providing a brief but rigorous, introduction to the paradigmatic positions which underpin educational, social and behavioural research activity. Our decision to provide this information was not in question – it was based on the belief that distance education, despite its particular characteristics, is not a distinct educational 'genre' and therefore our students should be familiar with these positions and the debates about their appropriateness in research in and for education. The richness of the literature about the interconnectedness between philosophical and methodological issues within paradigmatic positions meant that there was an obvious temptation to explore general problems in the epistemology and legitimation of knowledge (Nunan, 1990) at the expense of our proposed focus upon researchers and research practices within distance education. It was our intention that students should rapidly achieve this background in research paradigms and then apply this introduction to research activity in the area of distance education. We were fully aware of the significance of this dilemma. For students to be able to argue powerfully for methodological directions within their own research activity, it would be necessary

to rehearse a knowledge base founded upon the paradigmatic positions, yet to provide this too rapidly would lay us open to the charge of inadequacy and superficiality within an area which represents the heartland of the academic enterprise. Such a charge would not serve students well.

To add further complexity we felt it was essential to design course materials, not only from the viewpoint of academic debate about research paradigms, but also from a perspective which wrestles with identifying and designing possible interactions which would help shape learning. It was therefore not sufficient to point to a convenient text which displayed the debate in a particularly efficient or elegant fashion. Our task was to go beyond this, to invite students to engage with the area in ways which would see them own a research problem, recognise the problematic nature of their input and take calculated risks in forging possible approaches and solutions. The first section of the course was to begin this process and to achieve it we sought to borrow from an established perspective contained in Carr and Kemmis's *Becoming critical: knowing through action research.* As *Research in Distance Education* was preceded by a *Critical Issues in Distance Education* course, there were advantages in using Carr and Kemmis. Students would have some familiarity with the general impact of critical theory upon educational issues and this might assist them when working through the text.

However, we were particularly concerned to use this text not so much as an argument for fostering action research, but as a vehicle to describe paradigmatic positions and enable analysis of issues from current research and writings about research in distance education. Thus the individual chapters, rather than the whole, provided the way to introduce the particular 'world views' constructed by different paradigms and it would be our task to link these to a second text, *Research in Distance Education 1* (Evans, 1990) and other literature about distance education. Also, we sought to extend aspects of the Carr and Kemmis approach by introducing other writings about research activity which raised additional problematic issues.

These matters were only part of the educational solution to our problem – there was still the issue of identifying the possible interactions between students, the materials, ourselves and perhaps between other students or colleagues in workplaces (Elton, 1987) which would constitute the framework for the study experience.

As a design issue we would need to consider avenues through which we, as teachers and learners, would work upon these resources in ways which involved the progressive construction of both learning and teaching environments.

It is here that we met the well worn issue of independence vs control within education at a distance. (Garrison, 1989; Juler, 1990) How would we, as teachers, set a balance through the design of external materials and our teaching at a distance? How could we encourage the leave space for learners to construct their learning environments within the course? How would we ensure that the form of our course, its materials, its language, and its assessment, portrayed our beliefs about this balance between autonomy and control? How would we address students as co-learners within the framework of their and our course?

In the first section we chose two devices. First we used a constructed dialogue between a teacher and learner. This explored the teaching and learning decisions that might be made about introducing research activity within distance education in an attempt to highlight ways in which teaching and learning environments could progressively interact and develop. Second, we tried to signpost ways in which learners could choose to engage with the materials through using only the parts they needed, or by following up their interests by working on certain issues more extensively.

Thus, while a section of the content – the paradigmatic positions and their application within distance education – was not negotiable, the application of content, the depth of possible treatment of particular sections and the way to work through the materials all involved decisions by the learner.

Our task of interweaving substantive concerns of distance education into paradigmatic positions provided a considerable challenge. Our technique was to view the same 'problem' area through differing paradigmatic spectacles, inviting students to complete a landscape from the views surrounding this problem. This re-focusing upon the one area sharpened the appreciation of ways in which the problem was reconceptualised and possible avenues of investigation were preferred depending upon the 'world view' in question.

In short we modelled the painting of different research landscapes according to paradigmatic positions – our activities invited students

to complete the landscapes in the hope that 'perspective switching' between paradigms would assist them when both conceptualising a research problem and planning an investigative pathway.

So, the first section of the course attempted to display its pedagogy to students, to engage students in conceptual issues, and ground debate within the field of distance education. Our support for students was to model processes: the constructed narratives about learning about research activity discussions were written to mesh concerns of education at a distance within general research issues; and analytic discussions were started within paradigmatic frameworks with students being invited to complete the paradigm picture.

Developing Part Two: resources on research in distance education

In this part of the course we wanted to present students with examples of research in distance education. Our aim was to use the paradigmatic thinking from Part One to reflect critically on practical examples of research and also to have 'real' researchers to tell their stories of doing particular types of research. We decided to leave this part relatively unstructured in that there would be no study guide or course book, but rather a selection of resources focused on the practice and findings of research in distance education.

We confronted two major problems with Part Two. One involved our need to provide a range of examples, preferably of contemporary research in distance education, and the other concerned being able to provide all this as part of course materials. We had a small amount of consultancy money to help us prepare material, but for a large part we would need to rely on material published in journals, edited collections, etc.

Our desire to provide a variety of resources which reflected research from several distance education settings and from the main paradigms covered in Part One meant that we were confronting the problem of a large volume of print.

Our search of the literature showed us that we were not going to find the range of material that we wanted. In some cases little research had been published from particular distance education settings (especially schooling) and from particular paradigms (especially

critical and feminist). We decided to set the *Research in Distance Education* collection (Evans, 1990), published from the first Research in Distance Education (*RIDE '89*) seminar at Deakin University, as a course text because it represented some contemporary statements and findings from the field. We then selected a collection of readings which were inexpensively reproduced and bound so that they could be changed every year or two as new material was published. In this way we provided a satisfactory number and range of resources on research findings, especially given the access our students have through the Universities' libraries to current journals and publications in the field.

However, we also wanted Part Two to bring the researcher into focus as the producer of research findings. Our purpose was two-fold: to show that research was implemented by 'ordinary' people who had a variety of practical, theoretical and personal reasons for doing their research, and to help students see themselves as the sorts of people who can also contribute to research in distance education. To fulfil our purpose we decided to use our consultancy budget to have some researchers in distance education write about their work and speak about it on audiotape. We were able to produce four small booklets on some forms of research in distance education. (Lockwood, 1991; Moran, 1991; Morgan, 1991a, 1991b) We would like to produce more as funds become available so that we can maintain a comprehensive contemporary range. We also produced a book on forms of evaluative research based on evaluation work carried out on an innovative course at Deakin. (Altrichter, Evans and Morgan, 1991)

All the printed and audio material for Part Two constitute the curriculum of this part of the course. Its pedagogy resides in the assessment which we shall discuss later.

Developing Part Three: researching distance education: from genesis to exodus.

The final part is the point at which we expect students to concentrate on thinking through the planning of a piece of research. It is fairly didactic in that it leads students through a series of research design and planning encounters which require them to complete activities, most of which form the basis of a complete research proposal and constitute the final assessment for the course.

In developing Part Three we were able to draw on our experiences as researchers and teachers of research methods in other contexts.

In some ways we were able to follow established approaches to research design and planning, except that the practical contexts and issues of distance education had to be encountered. Two important considerations shaped development of Part Three.

First, we believed it was important that we should not require students to plan a fictitious piece of research. In Part Two the students encounter 'real' researchers talking and writing about their 'real' research, and so in Part Three they are expected to assume this role in planning a research project that they intend to have a reasonable expectation of implementing. For example, they could plan a piece of research which they were able to do or even required to do as part of their work, they could use a piece of research which they were submitting to a funding agency, or they could use the research they were intending to complete for their final 'minor thesis' for the MDEd.

Our second consideration was that Part Three should provide an adequate preparation for commencement of the minor thesis. It is often the case in coursework postgraduate degrees, where there is also a substantial component of research leading to a minor thesis, that students confront this work ill-prepared for what lays ahead. Also, there is often a problem of matching supervisors to students because it takes some time for topics to be selected and developed. Our intention is that by the end of Part Three all students will have experienced the development of a detailed research proposal and that those who have elected to do this in the area of their minor thesis will also be well on the way to commencing work. Thus supervisors can be allocated to them appropriately and promptly.

The considerations we have outlined here play an important part in providing cohesion to the *Research in Distance Education* curriculum itself and to the MDEd curriculum more broadly. Part Three, which is presented in one perfect bound A4 book, is divided into the following sections:

Genesis: creating research
Formulating a research project
Reviewing the literature
Developing a research plan: schedules and budgets
Ethics
Writing a research proposal
Managing and supervising research
Exodus: reporting research

Each section has some study material and activities, and usually a reading and recommendations for further reading. The activities are mainly practical in the sense that students are expected to work on an aspect of the research planning process in the light of their thinking and reading on the section in question. As the activities are completed they gradually build-up into most of the components of a typical research proposal to a research funding body. Their final assignment requires them to draw all these components together and refine them into a proposal for the final assessment.

Part Three reflects an intensive and focused pedagogy, although it is focused not so much on a body of knowledge as on a set of skills and knowledge constructed around each student's proposed project. So in this sense the curriculum is individualised but around a prescribed research planning framework. This contrasts markedly with Part Two which lacks any overt structure of either a pedagogical or curricular kind, except for that provided through the assessment which we shall turn to next.

Assessment

A key test of our ideological stance about teaching and learning would be in our framing of the assessment . As we believed that students should construct their learning environment within the framework of the course it was imperative that this act of construction and engaging with their version of it become valued through the assessment process. Consequently, our assignments had to provide space for students to tell about their exploration of the literature and give opportunities for recounting their analysis of the issues and the literature that they chose. Thus assignments were devised in ways which provided a structure for students to reveal the ways in which they explored an area of their research interest – our questions involved outlining processes and frameworks, suggesting evaluative and critical analysis against a range of criteria. Further, students could choose, within the second assignment, to provide one extensive or two shorter analyses thereby providing additional flexibility to account for individual interests and needs.

The first assignment covering Part One requires students to write a review of two or three readings they have pursued beyond those provided in the course. These further readings are centred on the matter of paradigms in distance education and students are asked to review them in the light of the contribution they make to the thinking and debates on paradigms in research in distance education.

The intention here is to assess how students have learned about the paradigmatic issues in educational research and to see how they can relate this learning to their reviews of their selected readings. In this way we are not asking to be told what we have taught, but rather to see how the students apply what they have learned to some areas of the literature they have exercised some choice over.

The second assignment, alluded to previously, provides the only pedagogical framework for Part Two. Here students are expected to write a critical review of two or three readings from this part of the course. The critical review is specified according to a series of points which are to be covered in the assignment. Broadly, these span the application of the paradigmatic concepts from Part One to the analysis of the resources in Part Two. There is a wide content choice provided in the course material resources but the series of critical points provides a fairly tight sequence with which the students must frame their critical analysis.

The third assignment covers Part Three and, as discussed previously, culminates in a research proposal developed from the sequence of activities it presents. The form of this assignment is expected to be a research proposal complete with a title page, abstract, budget, etc. It is expected to reflect the learning from Parts One and Two.

The weighting of the assignments for assessment purposes is 25 per cent for the first, 35 per cent for the second and 40 per cent for the third. Given the overlapping nature of the second and third assignments with the learning required for previous assignments, this weighting reflects the cumulative significance of the latter assignments as much as their work requirements.

Conclusion

So what, if anything, can be said about the process of curriculum and educational design from our practice. First, it is clear that there are certain strategic decisions that are made because of our view of teaching and learning at a distance – the principles that we apply to particular instances and examples are part of our core values which identify our beliefs as teachers. These values are ultimately social values – that is, they represent views about the rights and responsibilities of individuals within social systems.

Second, the application of a principle presents the best way of identifying and understanding the principle – that is, principles about designing materials are best seen in action through choices made when 'constructing' a teaching and learning activity in a particular context. The act of constructing is an expression of the fact that teaching implies purposeful activity directed towards learning – we can never be absolutely sure about the ways in which learners might respond but we nevertheless express our teaching and learning purposes as a series of choices when designing materials. The main principles employed involve:

- beliefs about learners and learning – the role of motivating learners; establishing purpose; forms of support and intervention; matters of control (prescription of content) and independence.
- beliefs about the function of teaching in fostering learning – teaching as instructional engineering; teaching as guidance and resource provision.
- beliefs about the social purposes of the content and processes within the course – knowing as empowerment; learning as a hurdle and social screening device; the 'social currency' of the content (Who values it? Why? How will it help those who have it? How does it exclude others?).
- the purposes of assessment and the ideal relationship between the assessment and the course artefacts – assessment is contained by the artefacts of the course; assessment is far wider than the issues contained within the artefacts of the course; assessment is always competitive and normative; assessment is, in part, framed by identifying acceptable criteria in relation to the stated purposes of the course.

Of course, none of the above is new. Further, they represent only a few of the sorts of issues which commonly arise when designing teaching and learning. However, it is clear that those engaged in designing course materials repeatedly draw upon their experience and political beliefs when addressing instances of these issues.

Third, the application of beliefs is always in the context of issues presented by the content area under consideration. It is impossible to carry out 'design' without a structural framework for the content and strategy for working with particular aspects of the content (its potential for explication through application or activity; its sequential relationship with other areas of the course; its exploitation in introducing intellectual dissonance; its value for promoting 'reflective'

activity) in relation to this structural framework. The image is not one derived from engineering or behaviourist psychology – instead it is akin to the creation of a musical score. The symphony is structured into movements each having themes and motifs – the total has been conceived in structural terms with the details being decided upon with the listener in mind. The techniques employed upon the listener exploit the resources available and at any one moment can be appreciated within both a local context and from the viewpoint of the whole. The listener acknowledges a range of styles as satisfying and intellectually coherent – likewise with the design of external materials there are different scores possible within a particular framework. Judging the quality of the design is complex and involves, among other considerations, judgments about structure and theme and their impact upon learners.

In short, our practice owes more to iterative processes, critical reflection upon purposes and pedagogy and creative leaps in deciding theme and motif than any prescriptive process which asserts a linearity between student characteristics, content, media, aims and objectives, assessment and such factors. The teaching and learning processes which appear in our course materials owe much to our critical analysis of beginning ideas expressed in the various preliminary drafts. Distance educators would do well to avoid prescriptive approaches to invention and design and heed calls to focus upon critical peer review (and, later student review) as a means of ensuring quality in education at a distance.

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CHAPTER 9

Preparing history courses at a distance

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For the past 13 years I have prepared 'distance' courses in Canadian History for Athabasca University (AU). During that period I have been sole author of seven courses, a contributor to two outside my immediate area, and 'course manager' for others. In addition I have had the opportunity to make revisions to several of my own courses and to purchased courses. Along the way my notions of how to prepare them have changed radically.

When I began to prepare my first course – Canada Before Confederation – in June 1978, I had few useful models. Athabasca, which became a university in 1975 (it had been a post-secondary experiment for the four preceding years) had only 15 courses in its calendar, and several were still a twinkle in some course team's eye. A few were bought, including a Renaissance course cobbled together from an Open University Foundations course and some materials written by AU faculty. I became the course tutor for the Renaissance course shortly after my appointment and soon learned from students that the study guides overwhelmed them rather than guiding them through the required readings. The completed AU-produced courses tended to be encyclopaedic and their organisational structure escaped me. It escaped students as well, and some courses had completion rates as low as 2 per cent.

The university had employed a large contingent of instructional developers whose role in the early courses varied from instructional adviser on a short leash, to principal author. It was clear in my discussions with these that most were staunch behaviourists. Their main interest was in breaking down content to bite-sized bits and in testing students' mastery of fairly easy objectives. Though I found their notion of education repulsive, there was much to learn in their practical formulations for course design. The idea of setting out clear 'learning objectives' seemed good in any educational context, but particularly at a distance where a professor's unstated directions for a course could not be deciphered in ways that might occur in a classroom setting.

But it was fairly apparent that the instructional design model worked best with education that was largely training rather than intellectual challenge. Memorisation and simple application rather than complex analysis were its forte. When a colleague queried one developer about how he would approach a unit on Fascism, a concept that has no easy definition, he responded with a straight face: "If it can't be precisely defined, why teach about it?" The head of the instructional design unit went further, informing me: "If you can't measure it, it doesn't exist." I did not think this fellow could be much help in putting together a history course in which alternative approaches to events and phenomena, rather than recitation of facts and dates, in my opinion ought to predominate.

Fortunately, the developer assigned to my course was less dogmatic than most of his colleagues. He was able to offer some constructive ideas regarding course structure, though interestingly, after I had submitted a draft of my first unit he said the structure was excellent, but it was his duty to give me the 'party line' on how to redo it. He made it fairly clear that I should ignore what he was saying. It occurred to me that the instructional development unit could potentially have become the centre of innovation in the university had it hired people with a variety of perspectives and tolerated a large degree of openness. But, like an economics department where everyone is a Friedmanite, or a sociology department where everyone is a Marxist, our developers sought ideological purity and only once hired someone who was not committed to the behaviourist paradigm. She didn't last long in the unit.

The great difficulty in putting together the first course was not simply to make it intellectually challenging and yet accessible, but to do so for an audience who would be accessing the course mainly in their own homes. Who were these people? How much would they read in a single go? How well could they pick up ideas from a written study guide? What approaches would they find friendly and what approaches intimidating? I read through Open University courses, courses from Quebec's Téléuniversité and our own, and discussed strategies with colleagues.

What I came up with was not especially exciting. I opened the first study guide with a number of provocative quotations designed to make students think critically about this country's history. One spoke of genocide against native people, the other of colonial repression of French-Canadians.

Students were told that perspectives on these big questions, rather than constitutional trivia, would dominate the course.

The first unit stuck to opposed theories of major developments in Canadian history and was fairly general. The following two units, each sub-divided into several parts, analysed key events with constant reference back to the theories presented in the first unit. The instructional strategy employed was a modification of the behaviourist model which the head of the unit informed me, 'meets the instructional baseline'.

There were overall *unit* objectives (though no objectives for various components) stated at the beginning. The objectives, however, used verbs such as 'analyse' and 'assess' which that model favours less than 'list', 'identify' and 'apply'.

Each reading was accompanied by explanatory notes, questions and a commentary meant to highlight certain points and, at times, to add additional information, usually in an attempt to provide the basis for a perspective other than the one reflected in the reading. At the end of the unit there were review questions, similar to those that would be posed in the final exam essay. Each unit ended with an assignment, since frequent testing at the time was seen as a positive strategy for giving students feedback and thus encouraging completions. Indeed, the first unit contained two relatively easy assignments meant to create student self-confidence.

There were some positive features to the course. I have a background as a journalist and the writing was punchy rather than scholarly. The editor reorganised and tightened various sectors to make the materials as comprehensible and coherent as possible. Students were asked to consider questions that provoked strong responses, such as whether the native peoples would not have been better off had the Europeans stuck to their own continent. The idea that history involved interpretation rather than a regurgitation of accepted 'facts' appealed to many students. Finally, the assignments could be done from materials provided to students, which eliminated the need to use libraries to produce essays, an important consideration for those in rural and remote areas. Our library loaned books to students free of charge, but long waits for the mail to bring books can discourage distance students.

But there were real problems with the course as well, problems that either would not have appeared in a classroom course or would have

been muted in that mode of learning. In the first place, to introduce students to the idea that the study of history involved interpretation, I began the course with E. H. Carr's *What Is History?* In a classroom setting the assignment of this text, coupled with explanatory lectures, would likely have created few waves. Many students would not have bothered to read it; those who did, and found it difficult, would have joined the non-readers in relying on class notes. Distance students, however, tend to panic when they are asked to read something that has a lot of unexplained references. The study guide made it clear that it was Carr's *concepts,* not his detailed examples, with which they should concern themselves. But students did get bogged down in the examples all the same. When the course was revised I removed Carr and provided a simplified introduction to historiography, using references only to current events so as not to lose the apprehensive who were almost waiting for reasons to say: "This course is too hard for me."

The large number of reading questions, intended to allow students to make a set of notes to complement the commentaries in the guide, also backfired. Students complained of the excessive numbers of hours required to write out answers; weak students were soon far behind schedule and eventually out of the course. Later courses have emphasised advance-organiser questions and reduced or eliminated the reading questions. The advance-organiser question, in my opinion, is a useful way of directing students' thoughts as they read. I always ask that once they have completed the reading they go back and answer the advance-organiser (in writing or in their heads) before going on to other material.

Extensive feedback via assignments also created unnecessary time problems. I now try to ensure that my courses have no more assignments and exams than a traditional university course will have.

What I learned from the first course was that I could make courses interesting and intellectually rigorous without turning them into marathons. In the traditional lecture mode, a professor can lighten the student load as a term goes by and it becomes clear the course, as originally conceived, is too heavy. That is impossible in distance education. A professor in a classroom can lazily choose unreadable texts and, if the lectures clarify the text material, may never know that the students got little from the assigned readings. The classroom professor who uses terms that do not define, or mentions events of which the students know little or nothing, will be asked for explanations from one or other brave soul in the group; a tutor

working with materials that make wrong assumptions about students' prior knowledge will also be questioned by brave souls, but the question and answer will not be heard by the other students in the course, many of whom will simply be afraid to be mocked for asking a stupid question: "I guess I should know... but who is Karl Marx?"

It is, of course, impossible to guess in advance every concept or event with which some section of students might be unfamiliar. And for marginal students with weak reading and writing skills, no amount of information or advice is a guarantee that mastery of materials or successful essay-writing will occur. Nonetheless, I have found that there are ways of choosing texts, presenting materials and providing suggestions for doing assignments that are of assistance to average and marginal students. Texts, it seems to me, have to be chosen for readability as much as for content. Where texts that are both readable and scholarly in a given area do not exist, articles collected in a book of readings often make a good substitute. When all else fails, the course author can produce a text.

When I produced a revised version of my post-Confederation Canada course, I found that the period from 1867 to 1900 was well dealt with only in texts and articles that were either unreadable or too narrowly focused. It proved easier to write my own short text for the period than to stitch together a book of readings that would have proved unnecessarily long if all the relevant subjects were to be discussed.

There are two pitfalls I have learned to avoid in presentation of materials. One is to assume that adult students doing a history course have any background whatsoever in history, or that any analytical concept whatsoever has meaning for them. I no longer believe that brevity is a virtue or that one can provide too many examples. The second pitfall is the over-presentation of concepts and events. In a classroom situation there are many clues as to what material you truly consider important and what is meant merely to 'pad' a lecture, amuse a crowd, etc. While a study guide should be chock-full of materials meant to get across key concepts and debates upon which evaluation will be based, it should be as free of digressions as possible.

With regard to evaluation, I remain convinced, despite instructional design protests regarding subjectivity in marking, that essays rather than computer-markable multiple-choice tests are preferable for university courses, particularly in the humanities where literacy is

still regarded as a *sine qua non* of the discipline. But, to make expectations clear, each of my courses now features 'sample essays' that demonstrate step-by-step how students should go about approaching, and finally writing, the assignments.

To avoid student problems with libraries, as well as the possibilities of students purchasing essays from essay banks, I avoid open-ended theme topics. Instead, I tend to assign essays that focus on one or more documents. The students are asked to assess, in essay form, the extent to which the documents corroborate and the extent to which the documents dispute claims made by authorities they have read in a given unit. This type of assignment requires that students read unit materials thoroughly, but exonerates them from trips to libraries which, as noted, are not possible for many.

Over the years student completion rates in my courses have tended to improve from the 40 per cent to the 65 per cent range, though the trend line has not always been smooth. Because Athabasca has no prerequisites for first-level courses we attract a reasonable percentage of students whose reading and writing skills are too weak for a successful completion of their humanities course to be likely. My tutors often try to steer students into 'Writing Skills' and 'Critical Skills' courses, and our Registry has been helpful in extending 'student contract dates' to give extra time to students who take a break to pick up a skills course. But, not surprisingly, most students who receive failing or marginal pass grades on a first paper, regardless of the reason, tend to drop out.

On the whole then, what I have learned about producing student guides is to put myself in the shoes of an average students and assume no prior knowledge. I worry less about whether my guides look scholarly to colleagues – for whom, after all, the guides are not being written – than whether the language of the guides is clear and lively. I have been told that I spoon-feed students, but I do not accept the criticism. Guides that read like textbooks or that provide nothing but endless pages of reading references are of little use to students. On the other hand, guides that have a series of questions but no commentaries, while they may prepare students for exams, fail to stimulate either interest or thought. The search for the happy medium – a guide that is both provocative and useful in preparing for evaluation – remains an elusive ideal but one which I think all academics working in the distance mode should constantly be pursuing.

CHAPTER 10

The virtual laboratory
A comicbook approach to teaching laboratory skills at a distance

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"I don't know how they expect me to teach this subject. We're supposed to give the external students exactly the same course as we give the on-campus students. As far as I can see it's just not possible. How can I fit the practical work we take a whole year to cover on-campus into a third of a week in a residential school?"

Projects begin in a variety of ways and this is how the one described here was presented to me.

If pressed to describe their work, most instructional designers would admit that their day-to-day operation is relatively routine. While we work with a number of disciplines and perform a broad range of tasks, sooner or later we all succumb to the natural human need to streamline and simplify what we are about. We develop checklists and 'rules of thumb'; we distil our knowledge to a standard approach; we develop standard practices. It's all part of the need to feel in control.

Subject matter experts assist this process. They seldom call on the full range of skills that most instructional designers possess. They don't make demands because they don't know what to expect. They have no frame of reference from which to understand what might be possible in a team interaction. The price we pay for gaining this sense of being in control is that we lose the spirit of excitement and challenge that our discipline potentially offers. Being challenged means taking on projects for which we have no immediate answers – for which the solution is not already known.

This project was certainly in the challenge category. It began during my period at Darling Downs Institute of Advanced Education in Queensland (now University of Southern Queensland). Like most such colleges at the time, Darling Downs drew many of its academic staff directly from industry. This was to ensure that its courses were

as up-to-date as possible and tailored to marketplace needs. However, the trade-off made to achieve vocational relevance was that many staff arrived with no previous tertiary teaching experience, or indeed of any teaching at all. These recruits from industry usually expected assistance in familiarising themselves with what was required, yet most new staff were lucky to have more than two or three weeks as a 'settling in period' before they were expected to be standing in front of classes. It should be explained too, that in the Darling Downs model, staff responsible for teaching subjects internally also taught them externally.

One day I was approached by the unit administrator working with one such staff member: "There's a new lecturer in Engineering who's working on the Civil Materials and Testing unit. He's having difficulty knowing how to fit the practical work into tl e residential school component. I suggested that I invite you along to talk to him about it."

Coming to grips with the problem

Prior to this time, I had also completed a Graduate Diploma in tertiary education. Well, I must say the world of engineering was foreign to me. My own professional training was in microbiology and education, so my challenge was to find a different instructional solution in a new field of study. However, I hold the view that instructional design derives its value from the fact that the principles it embodies are not discipline-specific. I saw this request as an opportunity to broaden my experience.

When beginning work on a new project I generally spend some time talking around the issues, trying to get the 'feel' of a situation. There is always a danger of jumping to a premature conclusion about what teaching strategy is required. Gaining a thorough initial understanding often results in a different range of solutions emerging.

Darling Downs Institute employed the course team model, a team typically comprising one or two subject specialists, a unit administrator and an instructional designer. The unit administrator was responsible for arranging team meetings and providing administrative support to its members. After the initial courtesies at our first team meeting, business began with the plea cited above.

Someone had been 'dropped in the deep end and left to sink or swim' and I don't think that he held out much hope that I could be of help. He wanted to be reassured that he wasn't misunderstanding what was

expected of him and while I sensed that I needed to move the conversation to a more positive note, I was conscious of the risk of raising false hopes. The fact that students studying externally received the same course as students studying on-campus gave me one way of 'getting a handle' on the problem.

"Can you give me a sense of what the internal students do in the practical classes", I asked.

"Well, they go through a series of the standard tests that are carried out on materials used on a construction site."

"They do the tests themselves?"

"Yes."

"And approximately how many tests would you normally cover?"

"Oh, about 15."

Another thought crossed my mind.

"The students will working on other units while they're here at the residential school, won't they?"

"That's right. Most of them will be working on at least one other unit. That's what I say. I don't even have them for the full week, but I'm still expected to provide a course which is of the same standard as the internals are receiving."

I was starting to get the picture, however I needed a better understanding of what actually went on in the practical class. I realised that I really needed to start putting myself in the place of the student.

"What do the students normally work from in the practical lab?"

"The standards. The standards for materials testing."

"No, I was meaning what instructions do they work from?"

"That's right," he replied, "the Australian Standards Association standards. We give them copies of the actual standards to work from.

"The standards laid down by the Australian Standards Association?" I asked.

"Yes. That's right. That's where we run into a lot of our problems. The students have enormous difficulties understanding them."

I was starting to see that there was more than one aspect to the problem he was presenting. I decided to probe this new facet a little further. "Is there any reason why the students need to have the actual standards?" I asked.

"Well, they need to know what the standards say."

"Yes. I understand that," I hastened to reassure him, "but do they need to learn that by working from the standards first?"

"No, not necessarily."

At last I had a point of departure, however by this stage I was starting to experience a need for more direct knowledge of what was being expected of students. "It seems to me I should try to get some feel about what is involved. I think that I need to spend some time looking over the standards. Would you have one test that you think would be suitable to start on?"

"Sure," he replied. "I guess a good one to start off with would be the Slump Test. That's a test that's done on concrete when it's delivered to a site. I'll let you have a copy of the standard for the Slump Test. One other thing – the Cement and Concrete Association has produced a good leaflet on how to do the test and I can give you a copy of that as well."

I have often found, when it comes to trying out a new instructional approach, that it pays to work through the idea on a small part of the material as a pilot, to discover any pitfalls before making a major investment in something that will not produce the required result. While developing a pilot in simple modules is now a widespread practice, at the time it was not at all common.

Faced with the task of working through 15 or so engineering materials tests, it seemed obvious that the way to start was to take one and work through it.

A day or so later the material I had been promised arrived on my desk. Glancing over it I realised that it would require more than a few minutes tc digest so I put it away to read at home that evening. It was a wise move. Engineering standards are drawn up by committees of experts and one might be forgiven for believing that they expect them to be read by no-one besides themselves. The language in which they are written owes more to the need to provide evidence for litigation than to the need to communicate.

I read through the standard two or three times to try to get an overview of what was involved. I then started to tease out the key steps (see Table 1, Task analysis).

Table 1
Task Analysis

Task analysis was one of the first procedures to be developed in instructional design. In his autobiographical account of the history of the discipline, Briggs (1980) described how staff of the US Air Force Training and Personnel Centre developed learning-task analysis to overcome the perceived inadequacies of job descriptions and job-task analysis. These procedures were the forerunners, he says, of what became the three distinct forms of task analysis: information-processing analysis, procedural analysis and learning hierarchies.

Davies (1973) distinguishes between six different types of task analysis which differ according to their underlying assumptions. These may be distinguished in terms of the bases on which they are carried out:

- objectives
- behavioural analysis
- information processing
- decision paradigm
- subject matter structure
- vocational schemata

According to Davies' typology, the type of analysis employed in the project which is described here would be one based on a decision paradigm; that is, it reduces the skill requirements to a set of operator procedures.

The task was not as difficult as it seemed initially. The Slump Test is really quite a simple procedure – that is why it can be used on-site. The strength of concrete depends on the water content of the original mix, however concrete does not develop full strength until several days after it has been poured. By that time, replacing concrete which is not up to specification can be very expensive. It is not unheard of for construction companies to have to remove a slab floor on a multistorey building site with jackhammers because of negligent or unscrupulous suppliers. The Slump Test provides a very simple, quick and convenient way of checking the water content of concrete immediately before it is poured. This was new knowledge for me!

The procedure involves the use of an open-ended galvanised steel cone to form a mound of concrete of known height. The cone is placed flat on the ground. Concrete is shovelled into the cone to partly fill it. The concrete is then tamped down. This is repeated two more times to fill the cone. The cone is then lifted off and the extent to which the resulting mound of concrete 'slumps' is used as the measure of water content.

My aims in carrying out the task analysis were two-fold: to break it down into series of steps sufficiently explicit that a person unfamiliar with the procedure could follow what was involved, and to document the breakdown in a form which could serve as a basis for discussion and action within the team.

I started out by breaking the task into the major steps – placing the cone, filling it, removing it and recording the result. I then took each major step and broke that down into substeps, switching back and forth between my breakdown and the descriptions in the documents that I was working from.

I cannot recall how long this stage in the development process took – probably two or three hours. The important point was that I didn't sit down and complete the process in one session. At this stage I was feeling my way as I went along and I remember coming back to the task two or three times trying out different ways of setting out the information. In the end I chose a tabular arrangement using four columns. On the first sheet I set out the objectives of the test, worded in behavioural terms, and the equipment and materials needed to complete it. What was wanted was for students to be able to perform the test. Their understanding of the underlying theory would be dealt with elsewhere in the subject.

I began thinking about how we might design the package that would be sent to students. The task analysis would provide the basis for designing a very clear set of instructions on how to do the test, however most students would be unfamiliar with specialised equipment. It seemed that we ought to be using illustrations of some type, but how could we show the way in which the equipment was used. Perhaps we could use an illustrated set of instructions.

Over the next few days I returned to the material several times. The detail began to fill out. When the analysis became too difficult to follow I would scrap it and produce another. By about the fourth day I had distilled the procedure down to what I could fit on three sheets of paper. I was ready to meet with the subject specialist again.

I outlined how I had gone about the analysis and where I saw it leading and then left the material with him. I was hoping to produce an illustrated description of the Slump Test and I asked him to check the accuracy of what I had done so far.

"Oh, by the way," I said, "in working through the task analysis I came up against a problem I couldn't solve. Given the fact that the slump cone is metal and quite tapered, it looks to me as though there is no way a person could know how to fill the slump cone a third full by *volume* without having quite a deal of experience with the cone in the first place."

He smiled. "You're dead right."

"Well what do you do with the internal students?" I asked.

"We tell them to fill the cone one-third and two-thirds full by *height*."

I sensed that my success in detecting this weakness with the standard had greatly enhanced my credibility. It was clearly evident that I had negligible expertise in relation to the subject matter, yet in a very short space of time the skills I had enabled me to pinpoint a specific weakness in what was a highly technical description of the procedure. Perhaps I might have some solution to offer after all.

As it happened, that wasn't the last of that issue. A few days later the subject specialist came into the Department triumphantly waving a piece of paper in my direction.

"Change in the standard." he announced. "It arrived the day after we met. They've just fixed up that problem you found. What they get you to do now is to fill the cone one-third and two-thirds by height."

Acquiring skills through mental practice

We had yet to decide how to apply the task analyses to making the use of practical time more efficient. Several possibilities had crossed my mind: produce a series of videotapes to illustrate each of the procedures (a technique I'd used before in microbiology practical classes so I had some understanding of what would be involved); less expensively, develop a manual giving clear, succinct descriptions of the procedures, or use the information to alter the thrust of the practical classes, increasing the emphasis on understanding the purpose of the tests. It seemed that the most likely choice would be to produce a manual. We already had the support systems to do that and having a well-designed manual would provide a strong foundation for doing something more ambitious later.

While toying with these different possibilities an opportunity arose for me to attend the Annual Conference of the Australian Science Education Research Association (ASERA) group. One paper which attracted my attention was on the application of 'mental practice' to teaching practical skills (Beasley, 1978). It described a study comparing physical and mental practice and a combination of modes on the performance of undergraduate chemistry students doing laboratory procedures. As I was listening to the presentation it occurred to me that what was being offered represented one of the pieces to my jigsaw puzzle. By having students practise first in their imagination what they will later do in the laboratory, time spent in the laboratory could be cut (see Table 2, Mental practice).

Those who regularly teach practical subjects know that the time in laboratory classes is not well spent. Students typically arrive unprepared and significant time is spent in social conversation. All of these are factored into timetabling of classes and the design of practical exercises. My guess was that if we removed all the work that did not require actual access to equipment and tutors, then the time required to do what remained would be well within the 15 hours of practical classes that were available. Making use of the principle of mental practice offered the possibility of transferring part of the learning into the external mode. We could reduce the time needed in the residential school by having students complete part of the work before they arrived.

Table 2
Mental practice

'Mental practice' is the name which has been given to the introspective rehearsal or visualisation of psychomotor skills (Oxidine, 1968). It has been studied as a psychological phenomenon (Fitts and Posner, 1967; Minas, 1978), as a means of boosting athletic performance in sports (Ryans and Simons, 1981) and improving laboratory skills in science (Beasley, 1978, 1979,1980).

In reviewing the literature on mental practice Richardson (1967) was able to find references to studies as far back as the 1920s. He found that the evidence available supported the conclusion that mental practice does facilitate learning. Mohr (1971) reviewed 39 studies of mental practice in relation to sports psychology. Twenty-four contrasted mental practice with physical practice and of these 19 found them to be equally effective; four found physical practice to be more effective and one found mental practice to be more effective. Beasley (1978) found mental practice to be as effective as physical practice in the improvement of laboratory performance of undergraduate chemistry students. Finke (1979) showed that errors of movement produced through mental imagery were functionally equivalent to physical errors of movement in producing changes in visual-motor coordination.

There has been some debate about the mechanism by which mental practice affects learning. Pavio (1985) has suggested that the effect has both motivational and cognitive components, the motivational component resulting from representing behaviours associated with a goal or situation and the cognitive component resulting from the covert practice of skills or strategies. Fitts and Posner (1967) suggested that mental practice may be most effective in the initial cognitive stage of skill learning for a task which has a relatively high symbolic content.

In considering the relevance of mental practice to laboratory work it is important to distinguish between the learning and performance effects of mental practice. The performance effects will be of more interest to sports psychologists whereas higher educators will be more interested in the effects on learning. Thus the cognitive component of mental practice is likely to hold greater interest for higher educators.

Adapting the principle of mental practice to teaching at a distance

The idea of using mental practice to prepare students for what they would be doing in the practical class started to provide some pointers as to the form of the materials they would be sent. The function of the package would be to enable students to 'climb as far up the learning curve' as possible before arriving on campus. They should be able to imagine what it would be like to perform the tests themselves – the tests should be real for them, described in such a way that they could visualise what was involved.

The package would be used to prepare for the residential school. Students would be asked to mentally practise the skills each day for two or three weeks before their arrival. This would not only give them an understanding of the procedures, but also a 'feel' for how the test should be performed and a sense of its overall 'structure'.

I started to picture the type of instruction manual that would do the job. The individual tests would need to be clearly separated so that students would distinguish them in their minds; the illustrations would need to show explicitly what actions were involved; the captions would need to give an unambiguous description of what the diagrams showed.

I constructed a model of the teaching process in my mind: elaborate the intention of the test through a clear, succinct description of its objectives; illustrate the steps in the test through a series of diagrams, one for each step; show how the results should be reported, perhaps by including a table into which the results obtained in the practical class could be recorded.

Stripping diagrams down to essentials

Reflecting on how best to use diagrams in this situation, it occurred to me that we were actually in the process of developing a 'do-it-yourself' instruction manual in the best traditions of Readers Digest and Sunset Books. Obviously our budget would be a fraction of what these publishers could devote to such a project, but the outcomes we were looking for were much the same. I abandoned earlier thoughts about using diagrams to illustrate key steps, realising that the way to go was to use the diagrams as the basic means of communication with the text merely explaining them and presenting essential non-visual information. The steps of each test would be

best illustrated by presenting a series of diagrams with each step having its own diagram.

This led to a further realisation: the relationship between the steps could also be conveyed graphically. If the diagrams were arranged in appropriate relationship to each other and suitable labels were chosen, the sequencing of the steps would be immediately apparent. How the placement of the diagrams could be best used to convey the information on the relationships between the steps was not at all clear. One of the difficulties in dealing with hierarchically organised information is that the rectilinear page format fights with the exponential expansion of information in proceeding from more inclusive to more detailed. I decided that was really a problem for the graphic designer, but I wasn't at all confident that he would be better able to suggest a way of handling it.

I turned my attention to the illustrations themselves, recalling some research I had read years previously which compared the effectiveness of photographs, shaded diagrams and line diagrams in illustrating technical text (see Table 3, Diagrams in text). The research pointed to the superiority of line diagrams over forms of presentation offering greater realism.

Table 3
Diagrams in text

It is a commonly held belief that realism makes a significant contribution to the effectiveness with which learners can make use of diagrams in text. Yet the research evidence suggests that the opposite is the case. In a study of medical students' acquisition of concepts of parts of the heart, Dwyer (1967) compared presentations which used an abstract linear representation, a detailed shaded drawing and a realistic photograph with a simple verbal description. He found that the students learned equally easily from the abstract linear presentation and the detailed shaded diagram. However, the realistic photograph was no more effective that a verbal description alone. His findings were consistent with an earlier study by Travers (1964) which had concluded that the role of visual media in instruction was not so much to bring the student in close touch with reality but to help the student handle reality. The photograph is ineffective, it seems, not because it contains extraneous information but because it presents more information than the perceptual and memory systems can handle.

The manual would illustrate about a dozen tests. Even if there was no difference between an abstract diagram and a detailed shaded diagram in terms of instructional effectiveness, there would be a big difference in cost. A detailed shaded drawing might take three or four times as long to prepare, particularly as it would be more important to keep the elements of the diagram in relative proportion. The additional time would translate to additional cost at the initial design stage. For a project requiring between 200 and 300 individual illustrations, this could well determine feasibility.

All indications pointed to the desirability of simplifying diagrams to their essential elements. To give substance to my ideas I prepared a mock-up set of instructions. The result was rough but it illustrated the effect I was after.

Putting the package together

It was time to involve the graphic designer. I took my sketch diagrams, the task analysis and the brochure from the Cement and Concrete Association across to the Media Section. I explained that what I was wanting was to produce a mock-up of the Slump Test which could serve as a model for the whole of the manual. The goal was to devise a layout which would give students a 'picture' of how the steps in the test fitted together.

I arranged for the graphic designer to visit the concrete testing laboratory so he could see the equipment being used. He then prepared a series of sketch diagrams corresponding with the steps I had identified through the task analysis and pasted them, together with captions, in page format. We met again about a week later.

What he had produced gave a description of the procedure, yet the regimented rows and columns of diagrams owed more to the graphic designer's desire to achieve visual balance than my desire to use the layout for instructional effect. The goal of using the arrangement of the diagrams to convey the 'structure' of the procedure had been lost.

I tackled him on the layout.

"That idea won't work!" was his blunt reply. "The diagrams are going to get lost on the page and they'll be so small you won't be able to see what they're meant to be showing."

I had to agree. Yet it seemed to me that there ought to be a way of presenting the information which gave a better balance between the graphic and instructional priorities. However, I recognised that this required more time to investigate than I could give. The graphic designer was pressed by deadlines on other tasks. It was clear that he felt uninclined to indulge in creative exploration of the problem. Reluctantly, I let go of the idea but made a mental note to look at the possibility of regenerating it as a research project at a later date.

At the next unit team meeting we quickly got down to business. The subject specialist was pleased with the outcome and suggested that reference details for the relevant Australian standard be added immediately below each title. He also identified one or two errors in the way the illustrations had been drawn. It was evident that he was beginning to see the possibility that here indeed might be a way of handling the unrealistic timeframe of the practical class. Pessimism started to give way to optimism. We spoke about the other tests that needed to be illustrated. He jotted down a list – then added two more.

"I know that the students won't get through them all but let's include them anyway."

Now that the strategy for how we would proceed was mapped out the project advanced quickly. Within a couple of days the subject specialist had put together copies of the remaining tests and I proceeded to complete the task analysis for each, forwarding copies to the subject specialist for checking and correcting as I went. When the last of these was done I arranged for the two hour session in the concrete testing lab at which the lab manager went through each test in front of the graphic designer and the subject specialist. The graphic designer prepared diagrams for the remaining tests, pasting them up with captions. I checked the integrity of the material and had the subject specialist check the layouts for accuracy. Whilethe detail was considerable, our common understanding of what was required enabled the process to proceed smoothly. By the time the subject specialist re-entered the process the job was very near to being complete. All that remained for him to do was to check that no inaccuracies had slipped in along the way.

Putting theory to the test

The purpose of this account has been to give a sense of the process of moving from conception to product in creating the manual for Civil Materials and Testing. However, there would be little point in

describing this project if the outcomes had fallen well short of expectations. Fortunately this was not the case. Far from running short of time, the students were able to finish the practical work with two to three hours to spare. As a result the number of test procedures covered in the practical class was increased for the following year. The outcome was so obvious that it clearly passed what we were in the habit of facetiously calling the 'inter-ocular occlusion test' – it hit you like a piece of 'four be two' between the eyes. We did not need statistical measures to tell us that we had achieved an improvement.

Throughout this project we were less concerned with whether the method we were developing would work effectively than whether we were falling down in the way we were operationalising it.

Our prime intention of course was to correct such deficiencies. What we wanted to do was to pinpoint where they were and why they occurred. What we needed was to document where students were going wrong and why.

At the beginning of the week that the students arrived on campus, I gave both lecturer and laboratory technician a fresh copy of the manual. The idea was to record any problems students encountered so that this information could be used in the first revision. I gave the following instructions: "Every time you see a student do something incorrectly, observe what he or she is doing, mark the section where the procedure was described and make a few notes as a reminder as to what went wrong."

Following the residential school I called another meeting with the subject specialist and the laboratory manager. I could have included the graphic designer but decided that this probably wasn't necessary. The diagrams had in general been effective. Altering those illustrations that needed altering would be straightforward. We went through every text, step by step, updating captions, diagrams and legends. I didn't count how many changes we made but there would have been dozens. Many were quite trivial – typographic errors which had slipped through previously or changes in expression to make the sense clearer; a few were quite major. All testified to the impossibility of feed-forward mode and the importance of iteration and review to getting the product right first time.

Reflecting on my role as instructional designer

The role I played as instructional designer in the development of the practical manual involved a much greater degree of responsibility for the final product and more participation in the production process than is usual. The role resembled that of 'transformer', as described by MacDonald-Ross and Waller (1976), yet it also differed. My responsibility to the team was not to execute an agreed and well-defined process, but to invent one. My choice of offering to take primary responsibility for carrying the task through the successive stages was to enable the process to be adapted as it progressed. Had it been following an already well-defined sequence, then it would have been appropriate to have the subject specialist take a greater share of the load.

Clearly the project was different from those which we are usually involved with as instructional designers. It was more structured, more concerned with conveying a particular set of understandings, rather than presenting students with new perspectives. Instructional design is practised in many different contexts with different goals in view, so the fact that this project was 'out of the mainstream' is not a reason to invalidate it. On the other hand, it would be legitimate to ask how generalisable the method is. The subject matter being dealt with was of a particularly technical nature, so it could be argued that the method may have limited application. However, it is worthwhile noting that this is a common feature of higher education courses, even though we might not notice it. In a seminar describing this project a number of nurse educators commented on the number of standard hospital procedures that were applicable in their own area of expertise. It is not difficult to think of examples in other fields. Even in a subject such as art, there are certain technical skills with which students need to be familiar. The point here is that the method used was designed to meet a prescribed set of objectives and these related to laboratory tests for which there was a set sequence of steps. This is not always the case in teaching practical skills. It is not always so that there is just one way of going about a procedure. In some occupations it is more important to understand the basic underlying principles and standard procedures, with considerable scope to be inventive in the way they are carried out. In these cases it could be argued that providing a powerful illustration of how a procedure miscues the student into assuming that there is one 'best' method.

A postscript

Not long after the project was completed, the unit team leader left the institute and returned to industry. I became involved in other projects and in due course also moved on. The materials continued to be used yet underwent no further development. This has something to say about the way in which innovations by instructional designers tend to be seen as episodic and personal. Yet the products of innovation become the 'bread and butter' of distance education providers. In an increasingly quality-conscious environment, distance education providers' future 'bread and butter' will come from today's successful innovations. There is something self-defeating about seeking to foster innovation yet making no provision for institutionalising its outcomes.

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Acknowledgments

My thanks to Jenny Winn unit administrator for Civil Materials and Testing at the time that the 'comicbook' was developed, for checking that any inaccuracies in my reconstruction of events of more than 12 years ago could safely be put down to 'author's licence'.

Kevin Chase, Lecturer in Civil Engineering in the School of Engineering at the time, was the subject specialist who let a brash instructional designer loose on his material and allowed the 'comicbook' to see the light of day.

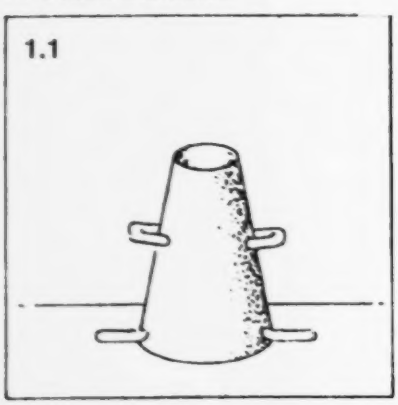
Alistair Inglis

Slump test
(Australian Standard 1012, Part 3 – 1976)

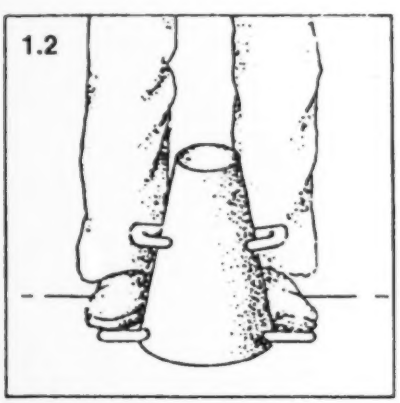
Significance The slump test is a measure of the consistency or wetness of fresh concrete and is also a simple method of ensuring uniformity of concrete on the site. The test is often used as an index of workabil ity of concrete in the design and testing phase

Objective Determine the slump of any sample of concrete to an accuracy of 5 mm using
a slump cone
a steel tamping rod
a rule
a bucket in which to sample the concrete
a scoop

1. Place the cone

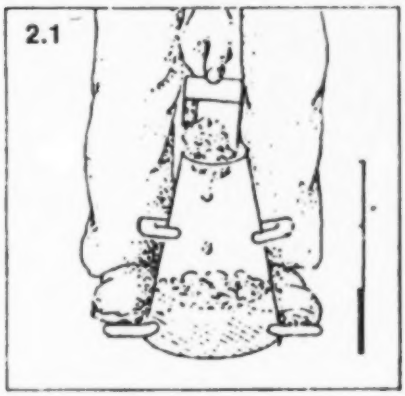


1.1 Place the slump cone, large end down, on a level non-absorbent surface. A steel plate would suffice in the field.

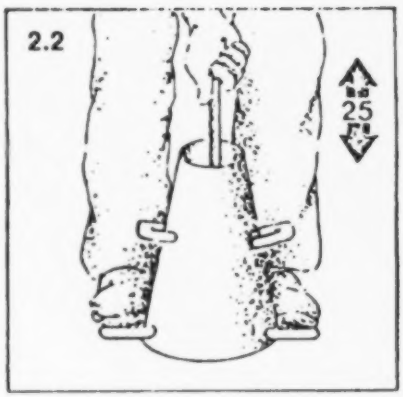


1.2 Hold the cone firmly in place by placing a foot on each footrest

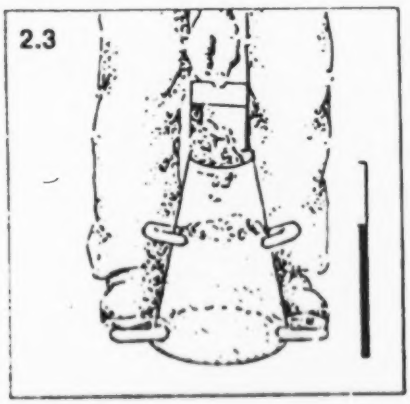
2. Fill the cone



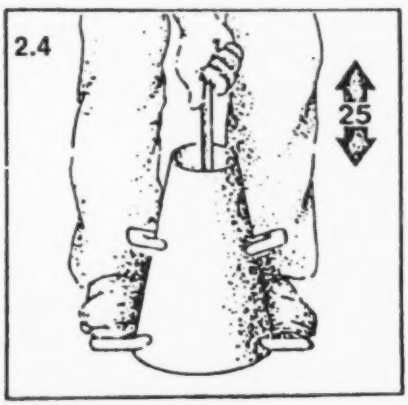
2.1 Scoop concrete from the sample into the slump cone to one-third the height of the cone.



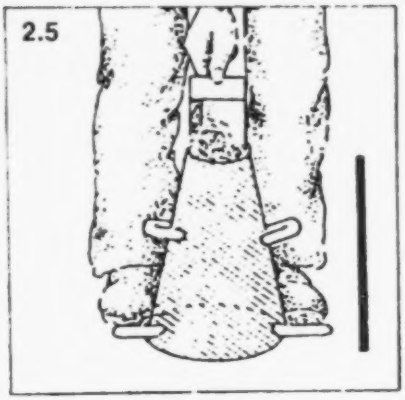
2.2 Tamp with a tamping rod 25 times.



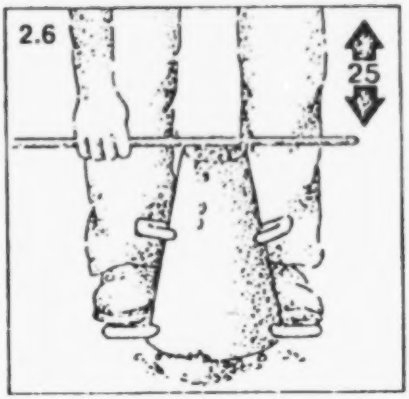
2.3 Place a second layer of concrete into the cone to two-thirds the height of the cone.



2.4 Tamp the second layer 25 times penetrating the layer underneath.

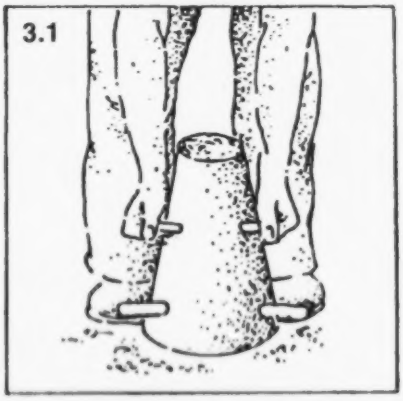


2.5 Fill the slump cone completely and again tamp 25 times.

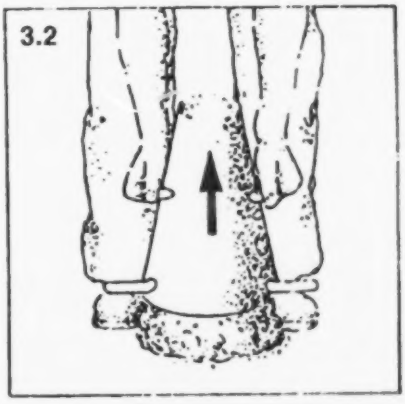


2.6 Strike the surface of the concrete off level with the top of the cone.

3. Remove the cone

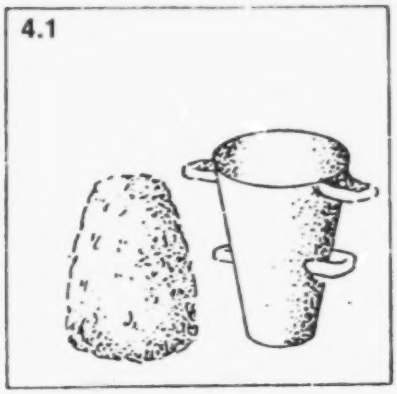


3.1 While holding the cone down by pushing down on the handles, remove your feet from the footrests.

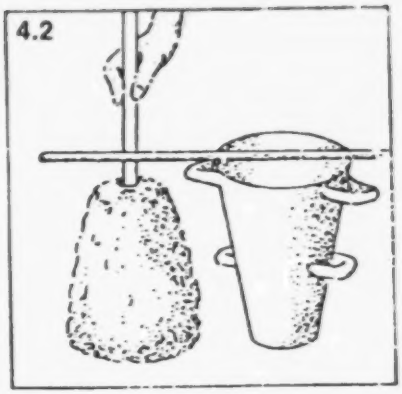


3.2 Taking about 5 seconds carefuily lift the slump cone carefully straight up without any lateral or torsional displacement so that the concrete is allowed to subside. If the concrete collapses laterally or shears the test should be repeated.

4. Measure the slump



4.1 Place the inverted cone alongside the concrete.



4.2 With the aid of the tamping rod and rule measure the amount by which the concrete has subsided.

Slump test
Laboratory record

Date	Ident.	Slump (mm)

Section 3

Some reflections by educational developers

CHAPTER 11

Developing distance education courses

Sue Warn, Leigh Brown and Terlochan Chemay
Mayfield Education Centre
Australia

Introduction – Leigh Brown

With more than nine years hindsight in producing distance education programs it is difficult to accurately respond to an invitation to recall our 'initial gropings to conceive' our launch. In recalling our experience we are able to include the perspective of the educator who was also the project manager; the authors of the two principal completed projects; and an organisational view of the distance education production and operations experience.

We also include our suggestions for those contemplating starting out, whether you be a teacher who wishes to switch or offer an alternative to your on-campus teaching, a course developer who assists teachers in developing distance education units, or an administrator who might be considering the feasibility of developing distance education courses.

Our account is as much about the practical difficulties, pitfalls and successes as it is about our ambitions to produce distance education programs which were to be genuinely interactive for the student.

Mayfield Education Centre (MEC)

Mayfield is the Staff Training and Development Centre for the hospitals and health services of Victoria. Annually it conducts approximately 250 post-basic or continuing education programs and some basic training. The Programs range from comparatively short workshops to Certificate level programs conducted part-time over 12 months.

Among some very successful programs were a number which we thought would be admirably suited for conversion to the distance education format. These were in strong demand from health services staff throughout the State and there was a need to improve access to them.

Sue Warn, Leigh Brown and Terlochan Chemay

Origins of distance education at Mayfield Education Centre

The two programs reported here, *Medical Terminology* and *Middle Management*, were successful on-campus courses which could not easily be transported to regional centres. A further need was identified for those who had completed the short courses on-campus and who wanted to further extend their knowledge and skills.

In the early 1980s the external courses then available in Victoria in middle management were either designed for a general industry context (not health services-specific) and obviously developed overseas, or were a diluted form of a higher level theoretical course with only limited practical application in the workplace. There was no medical terminology course available. At the same time, MEC was practising adult learning principles in the conduct of our on-campus courses and there was an expressed need to make this quality of training program available off-campus.

Organisational preparation and investigation

A survey of available external courses in the relevant subject areas was conducted by the then Director and the leader of the teaching group. These studies were extended to include an investigation of overseas experiences in the design and production of distance education and open learning programs.

Decision to embark on distance education

Given the need described above, the Centre decided to allocate limited resources to develop a trial distance education program in medical terminology. In developing the distance education materials it was anticipated that there would be intense educational development of the curriculum and materials by the subject expert. We also expected there would be consequent improvements in the on-campus courses and materials.

The course coordinator took on the challenge of converting her on-campus program to a distance education format with great enthusiasm, actively encouraged by MEC.

Approach to resourcing the projects

With the goal clearly defined to produce a distance education course in medical terminology as a conversion and extension of the existing

on-campus course, and with the primary source being an experienced nurse with excellent teaching skills and educational qualifications, the Board of Management made a broad estimate of a developmental budget on the assumption that the exercise might take six to 12 months.

The subsequent *real* demand for resources as we progressed through the project included:

- the author acquiring skills particular to distance education and writing;
- contracting a medical illustrator;
- employing an instructional designer with some experience in distance education;
- acquiring wordprocessing and later desktop publishing, capacity;
- upgrading the audiovisual production capacity to include audiotape slide production and a more sophisticated level of video production;
- the project leader acquiring skills in project design and management.

The way in which time was allocated for writing both programs proved to be a critical limiting factor. The writing for Medical Terminology was to be done by the sole subject expert, with assistance from the instructional designer and audiovisual producer, and it had to fit in with other normal teaching duties. This proved very difficult.

In the case of Middle Management, a project team of eight, including the senior educator as the project manager and five experienced subject teachers who conducted the on-campus management courses individually and sometimes jointly, authored their respective topics. Again their time allocation for development was fitted in alongside other on-campus teaching requirements and this proved to be a logistical nightmare.

MEC's decision to use existing expertise of experienced on-campus teachers as subject authors was balanced with considerations of the variation in writing skills and the particular skills required for distance education development.

Educational decisions

Course materials in each of the two projects were selected after an assessment of the end-user's available technology. Medical Terminology was to be developed primarily as a highly interactive print-based medium, with supplementary audiotape-slide material. This was later converted to video as well. Middle Management also focused on carefully designed interactive print medium, with supplementary audio and video material produced specifically for it.

A main emphasis through the materials development was to emulate the practical vocational skills of the on-campus courses Wherever possible we replaced experiential learning exercises used in on-campus programs with workplace experiential exercises. The educational models for distance education development were assumed to be an adaptation of the successful on-campus educational models. Above all, the materials were to be skills-based and experiential, the content was to be industry-specific to Victoria's hospitals and health services and to demonstrably lead to practical improvements in the workplace.

In summary then, the Centre and the relevant teaching staff were convinced of the need to improve the access to its on-campus courses. This was achieved by converting two very successful courses to the distance education format. We utilised the teaching experience, enthusiasm, skills and stamina of our on-campus teachers. Their experience in health services and education provided the necessary resources to produce these unique distance education programs.

Although some research into distance education/correspondence programs was undertaken, some allocation of resources was planned, and some ambitious development schedules were estimated, we had a lot to learn! The Centre embarked on distance education development with great enthusiasm. Sue Warn and Terlochan Chemay take up the story ...

Medical terminology – Sue Warn

When I joined MEC staff in May, 1982 there was interest in developing some courses into the distance education mode. In December, 1983 I was invited by the Director to undertake the project of transforming what was a successful on-campus course into a format suitable for external students.

Rationale

During the first year on the staff I found I was receiving a steady flow of enquiries about an on-site medical terminology course. At least half of those received were from people, most of them women, who stated that they were interested in the course, but would not be able to enrol because distance, work restrictions or other personal commitments precluded attendance at the Centre. These requests acted as a catalyst for us to examine the viability and suitability of developing medical terminology in the distance education mode.

The on-site course is conducted part-time, two hours per week over 26 weeks. A course workbook existed which contained the major content areas, as well as session objectives and exercises. The target group was clearly identified and the need for the course was undisputed.

Course development

After the initial excitement of having the proposal accepted had passed, I came face-to-face with the reality. I had undertaken to write a medical terminology course to be offered externally and I did not know where to begin. I had previously written some self-directed learning packages, but nothing of this magnitude and not for external studies.

Recognising that I needed to construct a course development plan, but not wanting to 're-invent the wheel', I had our librarian do a literature search for articles and books on writing external studies courses. One discovery was the series, produced in 1980 by the Council for Educational Technology entitled *How to Write a Distance Learning Course*. Here I found a development model I could use – a plan I could use to organise my thoughts and actions; and a resource through which I recognised the need for further discussion with management and other colleagues.

Under each of the headings in the model I itemised areas to be discussed and issues to be negotiated, and returned to the Director. Agreement was reached on areas which at the time were of prime concern, e.g. target groups, course aims, course design and time release for development. Others only partially addressed were resources, production and a pilot program. Issues such as marketing

and summative course evaluation were not addressed, but an undertaking was given to review these in the near future and I felt confident enough to proceed.

In hindsight I was naive. Given institutional and government departmental constraints, and the lack of expertise in distance education at the Centre, all of these issues should have been fully addressed and resolved prior to commencing course development. In addition there was the assumption that I could write this course – an assumption I accepted. This is interesting in light of Janet Jenkins' comment (1983, pp.316–320): 'Course writers today need training'. This I fully endorse. I had not previously been exposed to such work and felt a degree of trepidation as I read her paper. What I did was to use her '... minimum curriculum for training [writers]' (p.318) as a checklist for my skills.

With Jenkins' list and the CET development model before me I began, step-by-step, to write the course. It was designed with two major components. First was a basic outline of human biology with anatomy and physiology. This was the knowledge area which would help give understanding to the second component, medical terminology. Learning any language is dependent upon understanding what the word symbols mean – the medical language is no different.

The intent was that as well as being offered as a distance education course in medical terminology, parts of it might be appropriate for use in other programs where medical terminology or human biology were discrete subjects. Students of such courses would be able to complete some requirements prior to the commencement of their on-site instruction. This being the case, I interviewed staff members who were responsible for such courses to ascertain areas for special consideration and possible inclusion.

After these interviews, aims and objectives were written. I decided upon the following course design: it would be print-based consisting of a manual with a chapter introducing the students to the course and to medical terminology as a subject, followed by 16 units covering areas of human biology and the related medical terms. Support audiovisual materials were to be used (initially a slide tape program, a preferred instructional method of the instructional designer). This was subsequently transferred for VHS video format. Specific objectives were then written for each unit.

Time

At this stage one problem which had emerged early, but now developed with ever-increasing intensity, was *time*, or the lack of it! In looking at the area in the CET model, 'Resources and Constraints' (Unit 2, p.11), I had considered time. I knew I needed to be released from some of my existing responsibilities and a sessional lecturer was engaged to enable this. However, it amounted to only two hours per week and was for a period of six months. I was given permission to work at home, but it had to be when time was available. The problem of time remained with me throughout the development and implementation stages. I can but endorse Meintjes' (1987) comments in relation to the importance of time to course development. Time not only encapsulates each phase of the process, it permeates each phase. To ignore or treat lightly something of such importance is to risk at best a delay in development – at worst, failure.

Isolation

A second problem I encountered was one of isolation. I had written the aims and objectives, designed the format, written the units, designed in-text exercises, developed pre- and post-unit assessment tests, all without discussing any of my ideas or concerns with people involved in distance education. Although an instructional designer was employed in 1985, he had limited experience in distance education and was often a frustrator rather than a resource.

The Director and Deputy Director had made overseas trips looking at institutions that offered external studies courses, both general and within the health field. Although they were enthusiastic and supportive, their trips did not help *me*. An Advisory Committee for Distance Education was established and included two from different Victorian Colleges of Advanced Education which offered external studies courses. The Committee met once, discussed and made helpful suggestions regarding materials already developed. As time went on it became apparent that the Committee was not to meet again, and I expressed concern that we, as an organisation, were not availing ourselves of the considerable expertise that existed in distance education in this country.

While a second overseas trip was made by the Director, there was only one visit within Australia. This can perhaps be attributed to

the expressed concern of the then Director that 'outsiders would plagiarise our ideas and courses'. The Committee met only once more, I think to placate me rather than to seek their advice. I seemed to be alone in the thought that we were the ones who would be more likely to gain from the interaction.

Two things kept me going. One, I believed in what I was doing, the need for the course and its worth; secondly, I was intent on meeting the challenge. My error was not to force the issues. I felt I was discouraged in seeking outside assistance in developing the course, particularly because of the pressure to finish the project, and although I did develop some contacts at the pre-Conference Workshop at the International Council for Distance Education in 1985, I did not actively pursue these in relation to what I was doing. I am sure that had we sought support and advice our experience could well have paralleled Meintjes (1987, p.167) when he wrote of his visit to the University of the South Pacific: 'As a result of this valuable contact, we were able to adopt and adapt various materials for our programs, thereby saving a great deal of time and effort.'

Priorities

An additional problem which became evident in the development phase was the difficulty in writing distance education materials while maintaining other teaching and coordinating commitments – switching from one to the other, that is moving from the 'creative' mode into the day-to-day work and back. This problem was a major reason why development became protracted.

From this situation other difficulties arose – fatigue because of over-commitment and the need to recharge the 'enthusiasm battery' to maintain impetus. Development did continue even if the pace was slow. I used the literature a great deal and the slow progress did serve to allow time for the acquisition of books and journals related to distance education. This resource proved to be of benefit to me and to others who have followed.

Enlivening the materials

In writing the course in the distance education mode, a prime concern was how to make the materials 'live'. I was attempting to transform a course which I had been presenting very successfully in the traditional way into a very different format. The difficulty was not so much with the theoretical content, but rather the question of how to

transform the activities and action of me, the instructor, into the written word. I found some answers to these concerns by talking to people who had studied externally; others were found in the literature and later from students in the pilot group. During 1987 I became a distance learner when I enrolled in the Graduate Diploma in Distance Education.

The pilot program

As part of the CET development model I viewed a pilot program as an integral part of the development process. My preference was to have a small group of students, about 10, two of whom would be former students of the on-site course to act as advisers.

This preference was ignored when the Director negotiated with a major Victorian Base Hospital to conduct the pilot with a group of their clerical workers. I reluctantly agreed that subject to the suitability of the group, the pilot would commence some time after my return from leave in July, 1986.

The Director undertook all the negotiations and I was not privy to any detail of the discussions, including a commencement date. What transpired was the Personnel Department of the hospital selected 20 people willing to participate. This was done by circulating a memorandum to staff stating a course in medical terminology was to be offered at the hospital by MEC. On my return from leave on the Monday morning I was informed that the pilot course was to commence the following Wednesday. My initial contact with the pilot group was, in fact, the first day of the course.

In speaking with the hospital's Personnel Manager and the students it became evident that the course and the way it was to be presented was not what they were expecting. It is an understatement to say that I had grave doubts as to the successful outcome of the pilot, however I did proceed as there was an expectation from all concerned that the course would go ahead as planned.

My concerns were confirmed. By the time the students had completed Unit 3 all wanted to withdraw! After much persuasive talk I convinced seven to continue. Had appropriate discussions and selection procedures occurred prior to commencement, these seven people would probably have volunteered and been selected, as their commitment and advice throughout the remaining trial was invaluable.

Many changes to course materials were made as a direct result of the information gained during the pilot. The heartache, time loss, frustration, and I believe to a certain degree loss of credibility, may perhaps have been worth it if we had learnt from this experience and applied the knowledge for our next venture. It was not, but that is Terlochan's story and I will leave it to him. Long-term, however, the lesson has been learned and the knowledge is now being applied as we, as an organisation, commit ourselves to distance education as a valid alternative teaching method for our courses.

Course implementation

The pilot had not finished and we were still revising materials when we took on our first group of three new students. There was increasing pressure from management to offer the course generally to the health services and as the materials are issued in four batches of four units and the first of these was complete, no arguing from me could achieve a delay of the launch.

It was extremely difficult to coordinate and tutor a pilot course and a first intake of new distance education students, conduct an on-site course, and fulfil my other teaching and coordinating responsibilities. However, it was managed. The new distance education students did benefit in several tangible ways from the experiences learned from the pilot group and from the increase in my own knowledge gained from graduate studies.

First, course promotional materials listed the aims and objectives of the course, outlined its design and content and introduced MEC.

Secondly, in an effort to overcome the isolation distance education students often feel, I included a photograph, some autobiographical details and reasons why I had written the course in the introduction. Students were asked to complete a 'Getting to know you' form and to send a photograph. This proved to be of great value to students and instructors.

The third benefit was in the course materials themselves. Students were now presented with a three-ring loose-leaf folder to which they could not only add the official course materials but also additional exercises, information sheets or extra notes on specific topics.

Our experience since 1987 has shown that this choice of packaging materials was a good one. Institutionally it works well when facing

the logistical problems of despatch, and feedback from students shows that they have valued having materials in a format which enables them to add further relevant information.

Course evaluation

Evaluation should be a continuous process – a key element in course design, development and implementation. My own experience with medical terminology was that, at an institutional level, only some elements of the evaluation process were addressed.

It was necessary to evaluate or justify both the need for the course and its appropriateness for transformation into the distance education mode. Both were particularly important, as this was the Centre's first venture into this form of instruction. The decision to proceed bears testimony to the outcome of this phase of evaluation.

Evaluation of the content, design, methodology and technologies was done to some extent with the pilot group. Initially the process was satisfactory, but as the development phase became protracted the emphasis on evaluation waned.

The post-unit evaluation method designed and conducted by the instructional designer was cumbersome, in that the form was unnecessarily detailed and repetitive and students became bored with submitting. The more effective method of gathering feedback proved to be written dialogue between instructor and student.

No summative evaluation of the pilot was conducted. There was no commitment by the then Director to resource a post-course evaluation. I undertook to do the evaluation as my final project for the Graduate Diploma in Distance Education. I was permitted to conduct the study under the name of MEC, using official letterhead and photocopying facilities, but all other resources were to be my responsibility. The outcome was both interesting and useful. Students highlighted some problem areas which were not predicted. They had found the course useful; career opportunities had opened up for some; others found their work more meaningful and interesting. Some areas which were of a concern to me were not identified by the students such as –

1 clarity and layout of the textual component
2 intext spacing for interactive exercises
3 self-marking questions for the human biology section.

The second edition incorporated all the students' recommendations. Formal evaluation of our distance education courses is now standard practice, so my personal time, effort, expense and frustration have proved worthwhile.

Positive outcomes

The medical terminology course is something to be proud of both on a personal and an organisational level. Despite the hiccoughs along the way, lessons were learnt and the course is valued.

Opportunities for people to increase their knowledge and skills in this area are now open. To offer such opportunities is a prime reason for MEC to maintain a commitment to distance education as an instructional method in the health industry.

An additional benefit has been the improvement of the materials for both the on-site course and for others in which medical terminology and human biology are components.

Effective management for the heath professional – Terlochan Chemay

Once the decision had been made by the Board of Studies to proceed with the *Distance Education for Middle Managers*, the next step was to form a project team. This comprised the Deputy Director who was the head of the teaching group, the Coordinator of Management Studies, four lecturers and an instructional designer. The inaugural meeting was held in October, 1987. The Centre's expectation was to have the project completed and running within six months! First we had to resolve the education model to be used. We decided on the existing model used to successfully teach classroom-based middle management. The course content was expanded to include four modules with core and elective units of study.

After much debate and advice from the field, the final design was: four modules consisting of 18 units of study with no electives. A short, tutor-marked, work-related assignment was to be completed after each unit with a project proposal and final major report to be submitted for assessment at the end. The concept was to provide students with the opportunity to apply knowledge from their study to the workplace, to identify problems and resolve them systematically using the study materials. This integration of project work and study

material has proved to be highly successful, as indicated by the results of the projects.

One would be tempted to enquire: 'Why did Mayfield venture out on this distance education for the health services middle manager?' The answer is quite simple: the on-campus middle management skills course, consisting of a five-day program, had been successfully conducted for some time and was considered by course participants and management of health services to be very useful. Secondly, the target group was known and defined among the broad range of middle managers in health services of Victoria in both public and private sectors and the program had been successfully provided on a regional basis. Thirdly, there was no other comparable course available in the distance education mode.

Problems experienced by the distance education writing team

Having decided on the educational model, the next issue to resolve was how to write the material. This was not as easy as we first believed. An initial invitation was issued to staff to write specific topics. A literature search formed the basis for the first draft which was reviewed by the project team. Comments were given to the author, who proceeded to revise the original draft. Once this was completed, the instructional designer edited the material and built in interactive exercises in consultation with the author.

The author worked with the audiovisual producer to write scripts. It was intended that print and audiovisual materials would be reviewed by the project team, however the logistics of meeting teaching commitments and other responsibilities thwarted this. In practice it often fell to the author and the instructional designer to finalise the writing in consultation with the team leader.

The initial shock that the team experienced was the difficulty in converting a successful classroom experiential-based program to a distance education mode. It was far more difficult than we imagined! We lacked experience in writing for distance education. We sought to overcome this by carefully designing interactive exercises with the study material and the production of appropriate audiovisual aids – audiotapes and video. These required students to observe examples from their work environment and perform exercises in written assignments which were submitted for assessment and feedback by tutors. This action-learning design proved to be effective.

A special feature of the course was that the study materials were health oriented and targeted for the needs of a middle manager. Management principles, concepts and problems presented throughout the program had to be illustrated from current Victorian or Australian health and hospital scenes. This made the course relevant and overcame the problem of isolation and reduced the fear of returning to study. It was designed to be self-sufficient, requiring minimal additional reference material.

The team faced a logistic challenge in trying to combine the writing of the course at the same time as maintaining on-campus teaching commitments. The need to balance the demands of teaching and writing proved stressful and some of our initial enthusiasm waned. Individuals handled this problem in different ways. As would be expected, some interpersonal conflicts arose.

Different strategies were attempted to resolve these problems. Block release from teaching commitments was one method. This inevitably led to other staff taking on a heavier on-site teaching load. Working and writing from home was another strategy. This worked with varying success. There was no easy solution that suited every individual, as each had their own peculiar motivation to write!

Surprisingly enough, some even experienced the feared 'writer's block'! How did we overcome this? Mutual support, sweat and sometimes tears, would be a short answer. Attempting to keep up the momentum of creative writing and at the same time maintaining the standard and quality of classroom teaching was no easy task.

We also discovered very early in the project that the range of expertise, experience in writing skills and personal commitment had some detrimental effects on the progress of the writing schedule. To overcome these problems we met regularly as a group and individually with the project leader, carefully monitoring progress against set deadlines. We also used brainstorming sessions and explored ideas, experience and concepts from others on the team. This mutual support went a long way towards keeping the team going when things got rough.

Resources

The team had to work with limited resources. The instructional designer was not assigned to the project full-time. He had other competing demands on his time and expertise, such as writing

material for other Mayfield publications. Although desktop publishing facilities were available, more time was needed for instructional design development than was anticipated. Other resources for the team, such as the Henley Middle Management Educational package and information from Canadian programs and The Open University, UK, were useful background reference material. Literature held in the MEC Library on distance education writing and design were also useful.

The pilot program

The original projection was that the writing would be completed in six months, however due to factors stated earlier it took much longer. There was pressure to launch the pilot program and even though all the study material had not been completed, the pilot program was launched in a selected area of Victoria with 26 students.

In the meantime, the project team experienced other problems. There was significant staff turnover during the protracted writing phase which obviously slowed progress. To reduce the effect of such changes some staff who had left accepted contracts to complete their topic. At the same time, to provide reasonable continuity, new staff had to be briefed on the project materials and oriented to distance education writing. These were difficult times, and one result was the emergence of role ambiguity and the issue of ownership of the written material. However with regular consultations and problem solving, the team survived the stress and turmoil of the exercise and the writing was finally completed.

Whatever the stresses and strains the project team experienced as a whole, we are proud of our achievement, for the final product has proved to be highly successful and has benefited the students and their organisations. This has been demonstrated by the efficiencies and cost savings realised by students through their work-related projects.

A further measure of the relevance of the distance education program is that one major hospital in Victoria has embarked upon a staff training and development program with 15 students using the DEEM package supplemented by five on-site tutorials.

So what have we learnt from this experience? To:

- develop a detailed feasibility study prior to commencement and provide sufficient time for each phase of the project;

- arrange sufficient resource allocation – professional, technological, audiovisual, wordprocessing and desktop publishing;
- define project team structure and individual roles;
- allocate adequate time for subject writers and avoid the temptation of mixing classroom teaching commitments with distance education writing;
- ensure that the subject experts have distance education writing experience or provide them with these skills, and to select writers with commitment and sustained motivation;
- have all teaching material completed prior to launching a pilot program, and after the pilot program to thoroughly re-develop the materials prior to general release;
- have the project monitored regularly and to resolve issues immediately.

Looking back—and forward – Leigh Brown

With nearly nine years of hindsight, we report that a comparatively small, thinly resourced staff development centre was able to produce two very successful programs in the distance education mode. From modest beginnings we took on distance education to improve services to our potential clients in health services throughout Victoria. Happily, these two programs are enjoying success in the workplace judging by the response of students using the materials and the steady demand for course 'places'. Our experience may assist your organisation to develop or convert an existing program to the distance education mode.

Benefits for classroom lecturers and distance education writers

- Professional and educational skills of staff were extended and some gained distance education specific skills. Many involved in the distance education project have reported considerable improvement in the quality of our on-site teaching and course materials.
- The teaching group developed considerable logistic and educational administrative skills.

Benefits to students and client groups

- Our students from the health services professions have gained considerable experience and qualification, and this project has given them a major benefit by enabling them to access further education which previously they had been denied because of geographic, cost or time-release factors.
- Students report that the materials are highly interactive, practical and work-oriented, and easily used to improve their own work practices.
- Student support systems provided as part of the distance education program, with individual tutoring and feedback, helped their successful return to study.
- Some are stimulated to pursue further education and career developments.
- Some have obtained partial tertiary credits to facilitate further study.

Benefits to MEC

- Improvement in the quality of on-campus classroom work and course materials.
- Capacity to convert on-campus courses to successful distance education formats.
- Enhanced skills in the analysis, planning, development and implementation of education projects.
- Additional challenge and variety for the professional staff has also increased job satisfaction. Enhanced capability to produce sophisticated self-contained audiovisual training packages for use within the hospitals health services.
- The Centre has established secondary markets for our courses with interstate health service organisations.
- We now have a preferred project model for developing distance education programs.
- We have another option for the delivery of our educational and training programs to client groups.
- The distance education development programs have raised the Centre's educational profile and attracted tertiary level credits.
- For educational administrators there is potential for organisational development through conducting a regular distance education forum.
- To develop distance education proposals and refine the existing distance education programs and services.

- To monitor and evaluate progress of performance of the distance education operations group, students, academic staff and student support systems.
- To extend and support the development of distance education skills of educators, administrators and education services staff.
- To foster continuing interest in and organisational enthusiasm for distance education programs.

Notwithstanding our frustrations and success, we are aware that even small education centres are capable of entering the distance education field.

In the last two years we have produced six successful distance education type learning packages and have recently embarked on another with great enthusiasm!

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CHAPTER 12

Critical reflection on the theory and practice of course development at the University of New England

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This chapter applies critical reflection to the theory and practice of the course development process in an Australian dual-mode distance education institution.

The reason for this application is partly to counter the dominance of the instructional industrialism approach to course development which is reflected in the literature. Given the massive growth in single mode distance education institutions in the last three decades the dominance is understandable, and indeed useful to professional course developers who benefit from this research base. However such a theoretical approach is less than useful for academics writing courses in a dual mode institution where pragmatic solutions to the perennial problem of how to improve teaching material for students are required. This chapter is aimed at the sceptical academic course writer to show how pragmatic course development can be. This is the 'practice side' of the rationale.

The rationale also has a 'theory side'. Critical reflection, "the process through which human beings use their analytical powers to assess the elements of their lives against their explanatory framework (theories) and judge practice against theory lies at the heart of learning and offers the best means for improving practice" (Nation and Evans). It is therefore beholden upon all who wish to assist in the practice of distance education teaching – new and experienced developers, teachers and administrators – to practise such a theory.

Before teaching at the University of New England (UNE) can be understood it is important to describe the historical institutional environment. By 1985 it had been in external studies for 30 years. As with many distance education universities, it was operating in the methodology and attitudes of its establishment days. Thus teaching

material was seen as the responsibility of the academic. It was usually based on the despatch of lecture notes in either print or audio form, supported by face-to-face sessions – usually residential schools on campus or weekend schools in Sydney. No professional advice was given to academic staff regarding preparation of materials.

In 1985 one of the authors was appointed Development Officer, soon to be called Course Development Adviser, with the brief to improve teaching material. The nature and direction of such development was not stated.

Evolution of a theory based implementation strategy for course development

The appointee, experienced in course development at University of Southern Queensland and University of Papua and New Guinea, brought with him an almost innate belief in what has been called the 'scruffy' position of instructional design. David Murphy described this position at the ICDE Conference in Caracas 1990 as:

- theoretical knowledge is subordinate to practice;
- instructional design resembles a 'craft-like science' within which professional practice is characterised by reflection, action and reflection episodes – theory and research comprise only one source of knowledge that is to inform but not to prescribe practice;
- competing values within a highly dynamic context, with costs and benefits of pattern emphasises changing from moment to moment;
- the task is not to pigeon-hole discrete outcomes and apply standard practice treatments, but to 'ride the wave' of the pattern as it unfolds – theoretical knowledge is not used to prescribe but to inform intuition and to enhance professional judgment.

The UNE, with a repertoire in excess of 600 units and 350 academic staff, was clearly not an institution where all materials could be processed by instructional designers and editors. There was also a need to establish credibility for the development process, so the theory was wise to develop an area of teaching and learning which would have a high profile and would gain academic support. One high profile area linked to the practice of distance education at the UNE with a sound theoretical basis was interactive teaching material. Making teaching material more interactive became the major theory-based aim of course development.

Practice of a theory based implementation strategy

During the initial stage and following the appointment of the Development Officer, strategies adopted to achieve increased interactivity in teaching material were three-fold: to change the organisational base in the Department of External Studies (DES) to facilitate broad-based improvements in teaching material; to initiate staff development experiences; to establish exemplar models of teaching material.

The structural changes in the DES included removal of the hierarchical structure within the teaching material section; introducing a computer recording system to track the various production stages; in-service training teaching material clerks about development objectives; providing teaching material clerks with inservice training about development objectives; appointing new staff and moving towards a team approach to developing teaching material. The joint author of this paper was appointed Assistant to the Course Development Adviser as a result of this strategy.

The major thrust for staff development was through an orientation kit for academic staff, based on the philosophy of mixing exemplar model and content advice – theory and practice. Thus the first part, which new academics received on their first day had three components: the first was a distance education course, *How to write distance education material*; the second was an audiotape with accompanying visual material on *How to use audiovision in distance education*; the third was a video about *How to use video in distance education*.

The detailed administrative advice was sent as Part 2 when the new staff member's name appeared in the University's in-house news sheet. This was reinforced by a series of *ad hoc* seminars on techniques in distance education covering topics such as unitisation, game simulation, teleconferencing, computing and satellite communication. Academics received support to attend the 13th ICDE Conference in Melbourne and when the ASPESA biennial forum was held at UNE over 20 academics were involved.

The third part of the strategy was to develop exemplar models. It was reasoned that as a result of contact with course development staff, academics may accept suggestions about the most appropriate techniques for developing teaching material, and advice could be given about the various ways to gain assistance. Some of these

were the Academic Time Release scheme, the Innovations Development Fund, participation in development projects, and individual assistance from the Course Development Adviser and Course Development Assistants. Exemplar models still flow from this assistance.

The rationale of the Academic Time Release Fund was that it would enable staff to employ a substitute for them (usually in marking) so they could spend their time developing teaching material in a manner not otherwise possible – this was soon redefined as multimedia integration. The Innovations Fund paid the production cost of a distance teaching innovation. The theory behind the concept of development projects was that each year the unit would develop a project using a different technology. Academics would be invited to participate and if the projects were successful the technology would be available the following year as a mainstream teaching program they could choose from.

The first project was the integration of study skills into teaching material. Essay writing had been identified as a major problem for new students, so this skill was addressed in several units by setting out the steps of essay writing and including exemplar student essays with commentary. Another area requiring assistance was Human Bioscience, a subject involving statistics but undertaken by many Arts students with no background knowledge in stats.

A study skills booklet was produced which encompassed time management, terminology, a glossary, introductory statistics, as well as essay writing skills and preparation for examinations.

The next project was the use of interactive radio – the *Talking to New England* project, which won a Pater award in its first year. The third was the broadcast of video programs, followed by the use of E-mail for teacher-student discourse. The latest one, which has wider implications than just teaching, is videoconferencing using data compression techniques.

Implementation of these strategies which were devised and introduced by the Course Development Adviser, was facilitated by the appointment of an Assistant who tackled the tasks of developing various teaching material print formats, redesigning teaching material, assisting with the production of audio-visual packages, monitoring quality control, liaising with staff to ensure internal consistencies in teaching material and developing a range of teaching material models.

During execution of these duties, further developments and strategies ensued, but all were based on the foundations of theory already established. In practice however the limitations imposed by the small number of staff in the development team and the time-consuming nature of video production in particular led to a re-appraisal of the theory. It was clear such development was incremental and slow, therefore a 'shotgun' approach to development projects was adopted, the aim being to have the highest visible impact on the university community and demonstrate the value of development processes in improving the quality of teaching materials. Firstly several units were selected for intensive development assistance in print, audio and video media.

The small development team worked with an academic on the design of the unit, The Administrator and the Law. This package comprised a series of audiotapes in which doco-dramas were interspersed with commentary, discussion and interviews to cover the academic content of the unit. The audiotapes were reinforced with a booklet of summaries and each tape was supported by an accompanying colour-coded resource book of documents, cartoons, tables, illustrations, case studies, copies of legislation and newspaper clippings.

For the first few editions the books were literally tied up with legal red tape but this small touch was eventually abandoned as being too labour intensive. A video consisting of three segments from various sources which were linked by commentary was also produced.

During the course of these developments several resource deficiencies were identified, particularly in the area of graphics production and wordprocessing capabilities. These problems caused practice to diverge from theory but were partly resolved as the result of an agreement reached with the Armidale College of Advanced Education to form a consortium which would share staff and resources. It allowed for improvements in production efficiency and the quality of teaching material for students of both institutions. The development team was boosted by the addition of a graphic artist and two wordprocessing operators plus their workstations.

On reflection the gains were more than balanced by the dramatic expansion of academic demand and as a result practice continued to lag behind theory. The pressures were further increased when

a Macintosh wordprocessor and laser printer were installed and trialled with such success that the subsequent demand from academics meant that a decision was made to change the total wordprocessing system to Macintosh.

Another part of the strategy covered three simultaneous projects. A style manual was produced to assist in establishing a house style for layout of printed teaching material. All existing teaching material was converted from Wang to the new Macintosh format and the Course Development Assistant began working more intensively with one teaching department by means of seminars to staff and monitoring the quality of their teaching material.

The Department of Nursing Studies had a highly motivated and committed group of academics, however many of them were new to teaching and especially to the needs of external students. Several seminars were presented to the department covering layout and format of printed teaching material, use of audiovisual media, assessment techniques, choice of resource material, building in interactivity, sequencing, signposting, constructing self-assessment activities, evaluation, looking at learning styles, setting objectives, use of textbooks, teleconferencing, language levels and terminology, among others.

The standard of the print teaching material submitted showed almost immediate improvement and follow-up meetings with individuals and small groups sustained the upward quality curve.

Individual academics have ventured into audio media presentations but these have not been as easily established as the print media – partly because of the associated costs but mainly because of the demands on the academics' limited time. Most developments in these media have been undertaken as a result of time-release grants funded by the DEC.

Throughout this period, high visibility work was continuing with video production for telecast. A pilot project of 12 video telecasts (via ABC-TV) each followed by a radio talk-back session (via FM radio networks) was well received by students and the industry.

A second Pater Award was bestowed, but the demise of the Learning Network Program slot and the extraordinary workload of the small production team meant that commitments had to be reduced.

However, academics continued to request video programs to complement or extend their print and audio teaching material, so an agreement was reached with a consortium of State Departments of Education and Universities to telecast a weekly half hour program via the SBS-TV, TV-ED program block.

After reflection

A period of reflection became necessary when the UNE became a designated national Distance Education Centre. The expectation of the government was that the process of improving teaching material at UNE would continue. This and the promise that the government would review the designation of the DECs in five years forced the University to focus on its lack of commitment to development.

Taking advantage of this situation the small development unit in the DEC was able to successfully argue that, while the strategy to date had been successful, the impact remained limited because of shortage of human resources. It was accepted that to make a significant impact on the large number of units, six instructional designers were needed. It was anticipated that they could develop up to 20 units each year and thus make a major impact over a five year period. Consequently a team of instructional designers was appointed.

With this increase in human resources an instructional designer could be allocated to departments so the pilot scheme of departmental seminars was extended. Units needing development assistance could be accommodated. At the same time, university imperatives and indeed the national ethos, were directing the DEC towards cost recovery and entrepreneurial schemes.

The development unit of the former DES had previously been committed to assisting some outside organisations with contract work, for example videos and radio programs had been produced for the Law Foundation and the Human Rights Commission on behalf of a local Aboriginal communications company. Now the thrust was towards preparing submissions for contracting large scale projects and seeking a share of the National Training Guarantee Scheme and its payroll levy. The need for quick responses and short term contracted workers was met by establishing a commercial arm of the DEC which would handle all such projects.

Consultancies with professional educational organisations like Engineering Education Australia, other educational institutions (e.g. the trans campus Orange Agricultural College) and fee paying courses (e.g. UNE-Armidale's MBA) quickly followed. While the need for editing such courses was there, it became clear that the instructional designers were spending too much of their time on editing. Thus attempts were made to employ editors to work on fee paying courses with the hope that some spin-off to credit units would occur.

Conclusions

Reflection on the theory formulation suggests that it was appropriate at the time but it did not take into account the severe constraints that were imposed on its implementation. Progress through each stage was underpinned by a strong theoretical base but a multitude of problems, both foreseen and unforeseen, meant that strategies were often developed reactively rather than proactively. Hence the second stage was implemented primarily as a highly visible set of changes (i.e. wide distribution of videos and editing of print material for legibility, attractiveness and clarity) for political rather than theoretical imperatives. The third stage is still in progress since the aim of introducing more interactivity to the teaching material is not only more time consuming but requires much groundwork to encourage compliance from academics. Although the editing function now operates, much of the work edited is for non credit courses with limited benefit flowing to the credit courses.

Perennial problems continue to dominate implementation of the theory, such as late submission of teaching material which does not allow sufficient time for development work. High staff turnover in the wordprocessing area means that constant re-training is necessary and there are never enough skilled operators. The graphic artist's work is so well received that he is often swamped by work and cannot realistically meet deadlines. The printery has not always been able to produce the quality required for development projects. There have been problems with access to the services of the Media Resource Unit at times of high demand and financial resources have not always been sufficient for a quick response to various requests for new technology. In truth, the degree of success in developing distance education material remains variable. Critical reflections on theory and practice need to be linked with resources to fulfil the development role.

CHAPTER 13

Coming back to the question

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In September 1990, as a result of an invitation to participate in an open learning initiative, we began formal discussions about the possibility of developing two distance education courses in curriculum inquiry at the graduate level. We started with two givens. First, the proposed courses had to hold true to a constructivist approach to curriculum inquiry. Second, the courses had to be comparable to our on-campus offerings in content, assignments, grading and time (3 hours per week for 13 weeks), with provision for following student progress, providing instructor feedback and maintaining student contact.

First thoughts

When we began to discuss the idea we knew we would have to resolve a major pedagogical issue – the obvious difficulty of developing a constructivist approach to curriculum inquiry without adhering strictly to a technical model. Would it be possible to encourage and support individual student learning if everything was prepared beforehand? Since we used a predominantly discursive classroom strategy, would we feel that we had lost control of the process? Would students be able to facilitate their own learning with less instructor contact? Would the quality of student learning remain high without our continued personal support? These questions challenged us initially and at first we were not sure that such courses were possible. We were particularly concerned since in our classes, we try to model how students should approach their learning. We were even more concerned, however, that if we didn't attempt to develop a distance education course some of our colleagues with a more technical orientation to curriculum inquiry would. In a sense, we felt obligated to undertake the task. Our immediate reaction was that it would prove to be a difficult one, but our strong belief in the constructivist approach enabled us to make the effort.

From the beginning we did not have a particular curriculum model in mind. The intent was to make these courses interactive, to develop a dialogue among the learners and ourselves, much as we did in our on-campus classes. Using the learners' own knowledge as much as possible, we wanted them to create their own curriculum rather than adopting one we had prescribed. In so doing we wanted to try to keep a relationship with the practical. We avoided the 'application of theory-to-practice' approach wherever possible. Instead of asking them to adopt a given framework, we asked them to examine each writer's ideas in the context of their own situations to see how these might fit, or how they could be modified, depending upon their own personal knowledge. We wanted them to explore others' ideas, to identify their own taken-for-granted assumptions about curriculum and to reconstruct a new framework that was grounded in their own contexts. That was one of the challenges we faced.

This quote from the outline of our distance education curriculum courses indicates our own philosophic stance towards curriculum inquiry:

> *These courses have been designed to use your personal experience productively as a basis for much of what we hope to do. We recognise that you have a wealth of experience which, if called upon and used, can be a rich resource for learning. As a result, we have tried to develop these courses around a series of activities designed to tap this resource.*
>
> *These courses are not about absorbing knowledge and then reproducing it when necessary. They are about 'understanding' and 'finding meaning'. We are comfortable with the notion that there are opposing and contradictory points of view. All participants need not arrive at the same place as they work through this program. We have not tried to provide a series of recipes.*
>
> *These courses are designed to encourage you to identify and clarify many of the things often 'taken for granted' in education. We hope to be able to do this by questioning you in a way that will encourage you to use your past and present experience. Your own experience is not trivial and irrelevant. It is the context from which knowledge and meaning are derived. We hope to integrate your personal practical knowledge with existing theoretical knowledge.*

These courses are developed upon the following principles:

1 *You are a legitimate source of knowledge. You must learn to trust yourself and your knowledge.*
2 *Learning is not a passive exercise of absorbing knowledge (information) developed and transmitted by 'experts'. We hope you will take control and initiate your own learning.*
3 *Ambiguity and contradiction are not problematic. They can be helpful in pushing us toward a problem-solving, or problem-posing approach to learning.*
4 *Systematic reflection is an essential activity if personal experience is to facilitate a deeper understanding.*

Our task became one of adhering to our basic philosophic stance while developing these courses. Retracing the development is difficult. The recollection we are now engaged in is a reconstructed logic which tends to highlight actions as a series of purposive, sequential steps. Instead, a lot of often unconnected activities were happening at the same time. We could best thematise our beginning as confusion because we really did not know where we were going and we did not have a preconceived image of what the courses would look like. Our intent was to try to organise two of our current graduate level courses into a prepackaged program which would be faithful to the constructivist approach to curriculum inquiry. The whole notion of 'prepackaged' is the antithesis of what we were trying to do because it often presupposes a particular epistemological stance, one that we do not fully support. We therefore were on the horns of a dilemma. What could we do and how could we do it ? This paper chronicles how we proceeded.

Course evolution

We have been teaching these courses on-campus for several years. Through our in-class activities we structure the classes to address student needs and to encourage exploration of ideas. Although we thought this was an evolutionary, dynamic process, we began to realise that we had certain core ideas which were always explored. Following several brainstorming sessions, we decided to organise the proposed distance education courses around key questions that focused on these core ideas.

Arriving at the key questions

We were fortunate in that the off-campus students would have similar backgrounds to our on-campus students. They would be practising certified teachers with at least one undergraduate degree. Like their on-campus counterparts, they would probably not have a strong formal background in curriculum studies. We asked ourselves, "If we want to approach a constructivist notion of curriculum inquiry with these students, what kinds of questions would be important in encouraging them to use their own experiences to explore relevant curriculum issues?"

We started brainstorming to arrive at ideas and must have had 30 or 40 to begin with. Some were quite specific, others more general. This part of the process was easy for us. Next we subsumed certain ideas under others and tried to tease out the big ideas. We eventually had what we considered to be 12 important ideas in curriculum inquiry and put each into what appeared to be a relatively simple-sounding question. For example, "Is a value free curriculum possible?", sounds like a fairly simple question but behind it there are all sorts of ideas. Because it is apparently simple and can be approached from so many different directions, it provides an opportunity for students to relate very personal kinds of experiences to the material regardless of differences in their background experiences. Each part of this process required more thought and time than the previous step and as we noted earlier, the process did not follow entirely sequentially. Some questions fell easily into place; others necessitated days of negotiation and thought.

The 12 major questions around which the courses were eventually developed were:

1 Is there one model of curriculum development?
2 How has the curriculum in which you are currently involved changed over the last 70 years?
3 Is a value free curriculum possible?
4 What values are implicit in alternative models of curriculum development?
5 How do metaphors influence our understanding of curriculum?
6 How does language control our thinking processes and thus our understanding of curriculum?
7 How can the structure of knowledge be related to curriculum inquiry?
8 Are present day curricula reflections of social control?

9 Who decides the curriculum?
10 Can teaching be separated from curriculum?
11 Is there one model of curriculum evaluation?
12 Are schools in a state of crisis?

These questions provided the framework for 12 modules spread between the two courses.

The search for resource materials

After we had agreed on the major questions, we examined the instructional materials used for our campus-based courses. We thought it impossible to follow a constructivist approach to curriculum and develop a course using a single text or even a couple of texts, therefore in the on-campus courses we provided students with reading materials that would form the basis for class discussions. We could, on a weekly basis, choose articles which reflected the concerns and interests of class members. Each time we offered the courses we had added these articles to our files, so that we had a plethora of materials which included a variety of different experiences, ideas, critiques, research papers and readings. In this we were very fortunate, since the range of materials would be impossible to duplicate without a considerable literature search. Each time we have offered the courses, we have drawn from these materials and added others – one reason why we have never been able to find a text to do exactly what we want it to do.

We then reorganised our reference material around the key questions to determine the breadth of resources available and found that we had some writing to do. Ideas traditionally presented orally in classes had to be put down on paper in such a way that people could begin to relate to them. At that point we were still wrestling with how to make this a personal approach and took care that the writing reflected that approach.

Developing the modules

The design for each module consisted of a number of different topics centering on one of the key questions. After considering a number of alternatives we organised each topic around three types of activities: **introductory activities** to relate the topic to personal knowledge; **activities for understanding** to take the students beyond personal knowledge by exposing them to perspectives of different curriculum scholars; **activities for extension and enrichment** to encourage

the students to integrate their personal knowledge with that which they had developed through reading, then to synthesise the aforementioned and go beyond to the development of new knowledge. Table 1 is an example of the presentation of a selected topic.

Table 1

Sample topics and headings
Module 1 – Topic 6

Introductory activities

1 In your personal life, do you prefer most often to be told what to do; to do things your own way; or to do things cooperatively with others? Why do you think this is so?

2 In your 'teaching life', do you prefer most often to be told what to do; to do things your own way; or to do things cooperatively with others? Why do you think this is so?

3 What are the similarities and differences in your answers to 1 and 2?

Activities for understanding

1 Read the article entitled 'Hierarchists, Individualists and Mutualists' by Margoroh Maruyama. Although the author is a social system planner, not an educator *per se*, his ideas have a lot to offer educational practitioners. When he talks of different 'parties' involved in planning, these can easily refer to different interest groups in education. Don't be concerned if you find his mathematical modelling too difficult. He's simply trying to illustrate how easy it is to misinterpret events leading to different 'realities'. Complete the workshop enclosed in the 'Philosophy of Planning Workshop' envelope (see Tables 2, 3 and Figure 1).

Table 1 (cont.)

2 Would you categorise the planning philosophy in your school to be hierarchical, individualistic or mutualistic? What are the advantages of each paradigm from your point of view?

3 Complete the workshop in the 'Planning Curriculum Workshop' envelope. How would you categorise the curriculum planning approach of Alberta Education? From your point of view, what are the advantages and disadvantages of this approach?

Activities for extension and enrichment

1 Which of these planning approaches is most indicative of the board for which you are employed? Provide an example to support your choice.

2 Which of these planning approaches is most indicative of the school for which you are employed? Provide an example to support your choice.

3 Which planning approach would you prefer the administration of your school to employ? Why?

We decided to include questions and workshops as an integral part of each of these activities and it was at this point that we further organised the resources previously gathered under the different activities. Each topic was developed by going through the resource materials, identifying those most pertinent to the topic and then developing questions and workshops that would allow learners to relate the materials to each activity.

We viewed interaction with text as crucial. For example there were times when we presented students with two authors espousing different sides of the same issue, not simply for them to read but to try to enter into an exchange with the text itself. Through the use of nonjudgmental questions, we hoped to generate a dialogue between the opposing authors to help students identify the differences and to further their understanding of both points of view. They never just read something; they read it with an intent to respond to it in some

way. We often had them use the ideas of one author to critique another author's position.

In addition we developed a number of workshops as part of the modules to give students another way of entering into dialogue with the materials, calling for active engagement of the learner. Table 2 is an example of a workshop.

We also built self-interaction into the courses (mostly through journaling – see Table 4) so we could involve students in constructing knowledge. Self-interaction is an important part of their learning but from experience, we knew that it was initially difficult. In campus classes students were very hesitant about the worth of their ideas or felt that they could not properly defend them. In time they gained comfort when they found noted authorities who agreed with their point of view. They took satisfaction in developing ideas; "I came up with this all by myself, and even though someone thought of it 10 years ago, it's still neat that I've been able to do this myself."

Table 2
Philosophy of planning workshop

Instructions

1 Set the 'Philosophy of Planning Framework' on a flat surface.

2 Spread all the small cards (found in the small envelope) containing the different phases over the same surface (see Figure 1).

3 Group all the small cards (see Table 3) according to the number in the bottom right hand corner (put all the 1s, 2s, 3s, etc. together).

4 Your task is to place all of these small cards on the appropriate blank spaces on the 'Philosophy of Planning Framework'. Let's do one together. The first row on the 'Philosophy of Planning Framework' is entitled 'Philosophy' (note the number 1 in the bottom right hand corner). Select the group of cards that also has number 1 in the bottom right hand corner. Decide which of the three cards best reflects the views of a hierarchist [the part should be subordinated to the whole] and place it in the appropriate row under the column entitled 'Hierarchists'. Repeat for the columns entitled 'Individualists' [Society is merely an aggregate of individuals] and 'Mutualists' [Sharing: What characterises society is the nature of interrelations which the individuals develop among themselves].

5 Repeat the process followed in 4 for all of the other descriptors listed.

6 A key entitled 'Philosophy of Planning Framework Key' has been included to help you check your work.

7 Return to the module for more instructions.

Table 3
Philosophy of planning framework

		Hierarchists	Individualists	Mutualists
Philosophy	1	1	1	1
Logic	2	2	2	2
Ethics	3	3	3	3
Aesthetic principle	4	4	4	4
View of influencing others	5	5	5	5
Diversity seen as	6	6	6	6
Uniformity seen as	7	7	7	7
Change	8	8	8	8
Sense of the universe	9	9	9	9
Perception	10	10	10	10
Knowledge	11	11	11	11

The part should be subordinated to the whole. 1	Society is merely an aggregate of individuals. 1	Sharing: What characterises society is the nature of interrelations which individuals develop among themselves. 1
Reason from general to specific. 2	Reason from specific to general. 2	Complementary 2
Competitive. 3	Isolationist. 3	Working together – cooperative. 3

Fig. 1: Small cards

Harmony by similarity and repetition – symmetry, dominant theme and sub-themes. 4	Random, haphazard. 4	Diverse elements working together – avoidance of repetition – symmetry. 4
Missionary like work to convert others. 5	Individual beliefs. 5	Maintaining harmony. 5
Source of conflict. 6	Unrelated. 6	Resources, enrichment, mutual benefit, necessity. 6

Figure 1 (cont.)

Basic and desirable. 7	Irrelevant. 7	Impoverishment, decrease of resources and consequent competition. 7
Steps are small. The past is important in planning for the future – blueprint is essential. 8	Everyone does their own thing – there is potential for radical change. 8	Blueprint evolves from group. 8
Predetermined or almost predetermined universe. 9	Other ideas are suspect resulting in a decaying world. 9	Self-generating and self-organising universe. 9

Figure 1 (cont.)

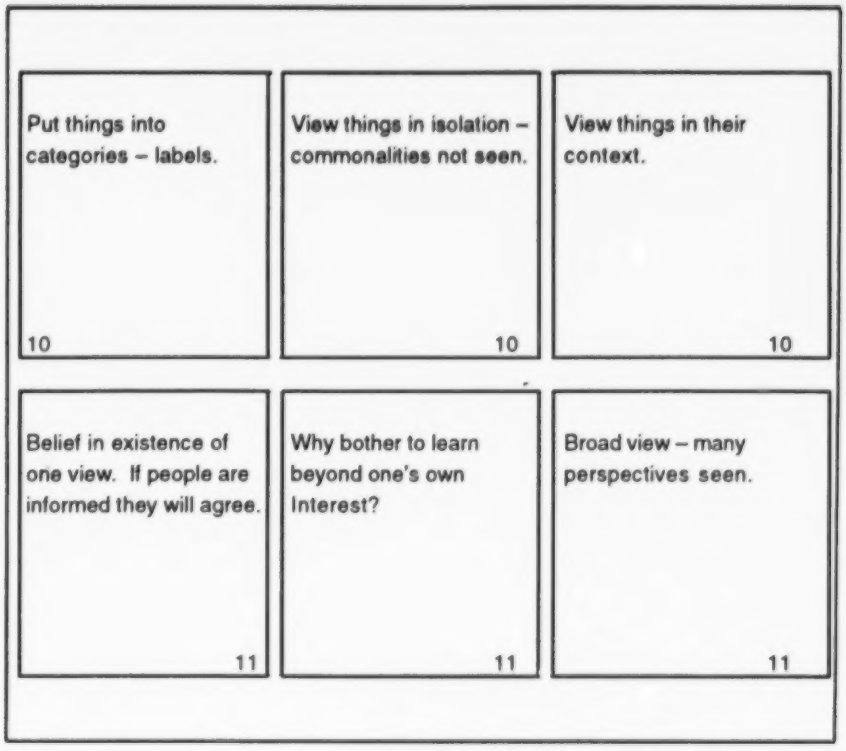
Put things into categories – labels.
10
View things in isolation – commonalities not seen.
10
View things in their context.
10
Belief in existence of one view. If people are informed they will agree.
11
Why bother to learn beyond one's own Interest?
11
Broad view – many perspectives seen.
11

Figure 1 (cont.)

Writing the modules

Writing the modules followed the development and sequencing of our key questions. They were mostly developed in order because they frequently contained references to a previous module. Upon completion we reviewed each module and double-checked our references to previous modules to make sure they were correct. We found, for example, that on occasion we had asked students to read the same article or book chapter in two different modules.

When we began, we locked ourselves in an office, shut off the telephone, turned on the computer and brainstormed ideas, making initial entries on the computer and brainstorming some more. We entered possibilities for topics, sub-questions and activities (within each module) and ran off a hard copy printout. Then we worked with the hard copy and added to it, deleted from it and generally changed it around. Just in case we always saved the initial format. We completed our modifications and then printed another hard copy. This cycle was repeated until we were satisfied and ready to pilot the module with an on-campus class. Revisions were carried out this way. With some of the shorter modules, we found that we could do the first draft in almost one sitting. Others took a lot longer. We cannot begin to estimate how much time we spent in this stage!

Piloting the courses on campus

We piloted different versions of the modules with on-campus classes. Students were given the materials and asked to work through them for the next class when feedback would be sought. After classes we met and asked each other, "What kinds of questions and suggestions did the students have?" We found it helpful to tape record some of our pilot classes, then go back and examine the kinds of things we had discussed. Modules were modified on the basis of student feedback.

Because we used the work of so many different authors in the modules, ranging from a critical social theorist such as Michael Apple to traditionalist Ralph Tyler, we knew that students needed help in working out a framework for these differing perspectives. While piloting the courses with students in class, we discovered that we did a lot more of linking authors' ideas than we'd previously thought. We were concerned that distance learners might get lost without something to help them focus their ideas. To provide a grounding without supporting a particular epistemological perspective, our alternatives were to further structure the course, either by writing the linkages ourselves or by providing another writer's view. We thought that the use of a textbook might be the logical solution but had great difficulty finding one that would adequately meet our needs. Eventually we agreed that Schubert, W. (1986) *Curriculum: Perspective, Paradigm, and Possibility*, New York: MacMillan could do this reasonably well because he approaches his text from three different stances – the intellectual traditionalist, the social behaviourist and the experientialist. The text did not provide the students with

new ideas or information but it helped them to tie the diverse approaches of the modules to a common framework.

It is interesting that we explored the use of a text *after* we developed the first draft of the modules. What would the courses have looked like if we had decided in the beginning to try to tie them into a text? Probably very different!

The distance education pilot offering

Following our campus-based piloting we completed revisions to the modules and proceeded with a pilot in a modified outreach program. This consisted of a class of 14 masters students from different locations around the province. They agreed to meet for five hours on each of three occasions in an urban centre located 100 km from campus. We met with the class for two reasons: to help students with problems that arose as a result of confusion or lack of clarity within the modules and to provide us with student feedback data to help us in a revision of the modules. Students had very few problems with the material. This is evident from the fact that even though we encouraged them to call collect with any questions, we had only three calls throughout the year.

In a campus-based seminar students tend to talk mainly to each other about what they have read but in an off-campus class students tend to talk to people who are not part of the class. Often students made statements like, "I talked to everybody on my staff about this and everybody agreed (or disagreed) with it." Many indicated that when they had read something and they wanted to talk about it, they would talk to another teacher. Some found this frustrating because that other person then asked questions which required them to backtrack through the ideas behind the question and explain the underlying assumptions. They found it difficult to answer the queries of colleagues who had not gone through the same readings and who had not had a similar experience.

The students who were school administrators reported that they often involved their staff in discussions: "I sat down with my staff and we talked about this." An interesting example was the principal whom we suspect 'tormented' his staff in terms of meetings to discuss different ideas. We got the sense that his whole staff went through the course as a professional development activity. His journals were interesting because of the struggles he had within himself. Feelings about educational practices that he had suppressed for years

suddenly became very important. Why had he 'bought into' the notion that results of provincial standardised tests were the best measure of the effectiveness of his school? Why had his teachers 'bought into' this notion? He wanted his staff to challenge these 'givens' and he set procedures in place to encourage them to do so. One of his journal entries referred to the discomfort these courses were causing him. He felt, in some sense, he had been happier in his ignorance, yet they had challenged him to address selected happenings in his school.

During our meetings with the outreach class we obtained important data about the time allocated for each module. We went through all the material and said, "Well, this is the first time the participants have encountered this material. The students aren't familiar with this, so let's double or triple the time." So we 'guesstimated' how much time it would take and then tried it out. We asked them to keep a log of the time spent on each module and then modified the times according to the feedback we got. We were generally close, but were off as much as 25-30 per cent in a few estimates. It takes between six and nine hours to complete each module.

It was only towards the end of the outreach pilot that we made final revisions to the introductory module. We described why we developed the modules the way we did and what our expectations were. We laid out our basic philosophy and how we were going to approach student journaling (see Table 4). We gave advice on how to approach the readings. Students were informed in the syllabus for the courses that:

> *There is much reading in these courses but you should realise at the beginning that there are different reasons (objectives) for reading. One type of reading requires that you remember much detail about what you are reading. This type of reading is generally for the purpose of transfer of information, establishing fixed procedures, retention of specific facts, etc. This course is* **not** *concerned with that type of reading. A second type of reading concerns itself with having the reader become familiar with the 'big idea' or concepts rather than minute details. This type of reading allows for the synthesis of the reader's existing knowledge with views presented by differing authors resulting in a re-conceptualisation of ideas. This is the type of reading you will be asked to do in these courses.*

The syllabus also outlined the nature of the assignments. It stated the following:

> *To this end there are four assignments:*
>
> ***1 Journal.*** *Journaling is a crucial part of these courses because it leads to reflection about what it is you are doing. Journals promote introspection on one hand and vigorous speculation on the other and as such, encourage meaning-making discovery.*
>
> ***2 A curricular reading of a book.*** *This will be a response to a work of literature, philosophy, etc. from the standpoint of curriculum thinking. The two-part response should include (a) a brief synopsis of the text, comments on the author's philosophy or world view (view of person-world relationships, person-person relationships, epistemology, etc.) and (b) a consideration of the curricular implications of that world view (for students, teachers, subject matter, society, etc.). For example, . . .*
>
> ***3 Curriculum analysis.*** *This involves the analysis of a curriculum-as-plan of your choice. For this assignment, we intend the word curriculum in its broadest sense. You may use a government curriculum guide, a commercially prepared unit plan, a personally prepared unit plan, etc. In doing this assignment we would like you to determine the underlying assumptions, tacit learnings, 'ends' being served, etc. in the curriculum you choose. . . .*
>
> ***4 Term paper.*** *Your term paper should be done in one of two ways:*
>
> *(1) Select a theme or themes (power, language, etc.) in which you feel your understanding has grown during these courses. Using your journal as your principal source of data, reflect upon this increased understanding, how you arrived at it, and how it has changed you as a person and a teacher/administrator. While it is not necessary, you may wish to consult sources other than your journal to help you elaborate on the ideas you wish to explore and present.*
>
> *(2) Select a maximum of three critical incidents (e.g. readings or journal entries you reacted strongly toward) while completing these courses and discuss how these have influenced you as*

a person and a teacher. You may wish to consult sources other than your journal to help you elaborate on the ideas you wish to explore and present. . . .

Another area of concern to us was evaluation and marking. Students wanted some understanding of how their assignments would be marked. At our institution we have what we call a nine point grading system. At the graduate level a grade of 9 or 8 is considered excellent, a grade of 7 is considered good, a grade of 6 is considered satisfactory and a grade of 5 or less is considered unsatisfactory. With this in mind we presented the following in the course syllabi:

Because of the nature of the assignments in these courses, we intend to use a holistic approach towards marking. That is, after reading each assignment we will mentally compare it to the work of current classmates and other ED SEC 503/504 assignments we have marked, and then try to assign it to one of the three categories outlined below. We hope this will help you interpret your mark. Even though we consider many intangibles (willingness to risk, creativity, etc.), we do not look for all we have outlined to be present in each assignment. We hope the following will give you some sense of how we will arrive at your mark.

8 through 9
These are superior efforts, presenting especially challenging or significant ideas, treating them with insight, depth and originality, and displaying a sophisticated understanding of complex material. The style of the analysis is inseparable from the subject matter and the mechanics of the paper approach perfection.

6 through 7
While not highly sophisticated or startlingly original, these are good efforts displaying workmanship, competence and clarity. The central ideas are reasonably varied and evident to the reader and the analysis focuses on these ideas throughout. The style of the presentation is consistent, appropriate to the assignment and indicative of conscious control of the writer. Sentences are concise and readable, words are used properly and mechanical errors such as sentence completion, spelling and punctuation are kept to a minimum.

> *1 through 5*
> *These are inferior efforts, confusing and uninteresting to the reader. The analysis presents central ideas that are too general or vague, meanders from one aspect to another without a sense of logical development, and suggests 'pre-writing' or an early draft rather than a finished product. The style is inappropriate to the material and the reader, and often internally inconsistent. Sentences appear awkward and confusing. The mechanical errors are sufficient enough in number, or glaring enough in type, to call attention to themselves and become a barrier to effective communication.*

We tried to address the concerns expressed to us by the students from our pilot programs. We went through the materials again and removed articles that increased the reading requirements but did not extend students' thinking. We cross-referenced everything, removed any ambiguities in the sub-questions and activities and extended our introductory module to include an example of journaling.

Reflections

The core of each module was always the question – either the key question or the sub-questions that were part of the activities. We kept returning to those as we developed activities and workshops and as we chose readings. Our discussions and reflections would not fit on a flow chart or in a systems model because they were more of a hermeneutic exercise depending on frequent revisiting to develop deeper levels of understanding. Many of the things we have been talking about were going on simultaneously. Trying to recapture the process is like recalling a past experience – it is gone so you are always involved in reconstruction.

Our major intent was to structure the courses in such a way that we would challenge the students to broaden their thinking – even to face 'false consciousness' – and we deliberately designed the courses so that students would be required to examine their taken-for-granted notions about curriculum, content and teaching. In so doing we were aware that the questions posed and the readings chosen reflected this agenda. While we did not want students to mimic our thinking, we did want them to question their own. We knew that we were successful when students began to criticise the course as a form of manipulation, or indoctrination to our perspectives. In the courses we are very critical about the notion of manipulation in classroom settings and yet we purposely set up this program

to challenge their thinking. Our rationale was that eventually manipulation would present itself to them as something that took place and that they could then understand and control. They readily accepted our explanation, but this process is something that we have wrestled with.

Another of our concerns reinforced by comments from pilot programs involved student evaluation and grading. We explored grading in a problematic way, to allow students to examine its relationship to learning. We explained that we could restructure the course curriculum completely so that it would fit the traditional university grading system, or we could try to build a trust with them which would let them explore the class more creatively. We wanted them to trust us to recognise that, if they took a risk and tried something quite different and it fell flat, we would recognise and applaud the risk and grade them accordingly. However there were students who were uneasy about it. We therefore provided flexibility for those who wanted a traditional system of evaluation and grading, but accepted others who chose to risk.

A major concern was maintaining regular contact with students. We agreed to provide telephone hours so they could call us collect on a 24-hour basis (with the aid of an answering machine!) and decided to have students keep a log or journal as part of assignments. At first students had great difficulty in developing their own journals.

Table 4
Guide to journaling

The rhythm we hope you will follow is to write, read, write again. It is most beneficial if your journal can be simultaneously developed at three different levels.

A. Level I.

Each of the modules you will be working through consists of a number of topics. Each topic consists of three activities: **introductory activities, activities for understanding and activities for extension and enrichment.** It is expected that you will answer questions included in each activity in written form in your journal. This will be helpful in a number of ways: it will encourage you to be an active rather than passive learner; it will help you generate ideas, observations and emotions; it will help with the creation and discovery of new knowledge; it is an opportunity for you to practise imaginative and speculative thinking.

Each journal entry should be a deliberate exercise in expansion. "How far can I take this idea? How can I make it make sense to me?" You should write often and regularly in your journals. Take risks with form and style.

B. Level II.

This will be an affective response to the assigned readings, activities and your **Level I** entries. You will reflect on how you felt about the things you have been reading. How are your feelings and experiences similar to the conflicts and themes expressed in what you have been reading? In addition, can you draw tentative connections between your **Level I** entries and how you feel? This will activate present feelings and the recall of prior knowledge. These entries should focus on ideas that are important to you.

Note: In many instances you will combine your Level I and II responses and this is fine.

Table 4 (cont.)

C. Level III.
This level is intended to be a series of reflections growing from **Level I** and **II** entries. At regular intervals (approximately two weeks after an entry) you should return to your **Level I** and **II** entries and reflect upon them. This return will help you synthesise insights gained from readings, analysis and your previous writings. This is an opportunity to reflect, to discover, to create and finally to articulate thoughts and feelings. It is an opportunity to explore your own belief systems.

The mechanics of how you set up your journal are up to you. However you do it, it will probably be helpful to have space set aside (left side of page, back of page, extra large margins, etc.) where you can respond with **Level III** writing adjacent to earlier writings. In a sense, it is like keeping two journals simultaneously.

We have included an article entitled 'Self-discovery through writing personal journals' by Sister Therese Craig at the end of this section. You may find it helpful as you formulate a plan for your own journaling efforts.

We have also included an excerpt from a student's journal entitled 'Student's Journal' by Bill Pritchard. This is not intended as a model that must be followed but merely as an example of an approach used by one student. We are confident that you will develop a personal journaling style that is most appropriate for you.

To help them, we asked them to write their journals at three different levels (see Figure 5). Level one was for a more or less traditional response to the majority of our questions in the activities; level two was for their reaction in a deeper sense to the questions, activities, and workshops; and level three asked them to reflect periodically upon their own journaling to help them examine how they were changing in their perspectives towards curriculum. Even after developing this guide, many still had some difficulty with level three, but most did grow in their ability to develop a journal. We found the dialogue with students through the journals a valuable way to obtain feedback, not only on student progress but also in the development of the modules. As well, students were appreciative of the opportunity to express their thoughts and to exchange ideas with us, even though it was through a somewhat artificial setting such as journaling. They missed the face-to-face contact, but journaling did allow for some contact. To our surprise, judging from the quality of their journals, students did *not* suffer from lack of face-to-face contact. In fact in many aspects of their assignments, they did as well or better than their on-campus counterparts.

When we began planning initially we were very concerned about keeping true to our philosophical stance while working within what we considered was a technical orientation to curriculum design. We were not required to follow an instructional design blueprint but could shape the courses as we saw fit. This was both a challenge and a worry, however it did allow us to work in the ways we found most comfortable. We held discussions whenever we had important decisions to make or when Swe wanted feedback on our process. We talked about what we were doing and what we hoped to achieve. Gradually we came to realise that packaged materials did not necessarily mean that the design was a technical one. We provided resources and rules for students; they actually constructed the courses. Did we succeed? To this point we feel confident that the students are finding the courses valuable, however monitoring the program, especially through the journals, will enable us to continue its development on an ongoing basis. Like the students, we keep reconstructing the curriculum.

Notes on the editor

Michael Parer is Head of Educational Development and Research at Monash University Gippsland Campus. His professional interests have broadly been within the areas of instructional psychology and the use of print and non-print media for education.

He was ordained a Catholic priest in 1959 and, after working in the traditional parish ministry, joined the Australian Broadcasting Corporation, initially in the Religious Department and then in Current Affairs. In the early 1970s he was asked by the Australian Government to set up the Migrant Educational Television Project.

He later spent five years in the United States at the Center for Innovation in Teaching the Handicapped in Indiana University and from there took up a position as Professor of Education at the University of Tehran, but the political climate forced him to leave after a brief period.

On his return to Australia he was appointed Assistant Dean for Course Development at Deakin University.

He has conducted research on textual design and student learning, on institutional policy, professional development and other areas as they relate to distance education.

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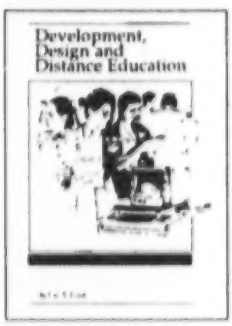
DEVELOPMENT, DESIGN AND DISTANCE EDUCATION



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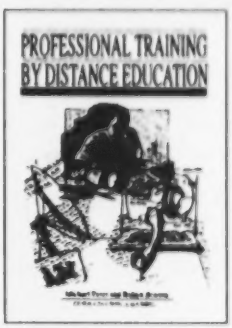

A student's eye view of distance education for administrators and teachers. Student self-report diaries offer insights about what it is "really like" to study at a distance.

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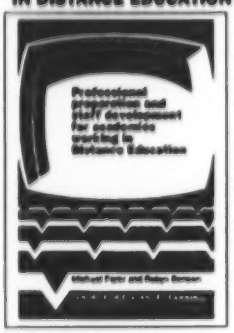

How to prepare staff for distance education, some policies and practices for staff development to improve future distance education.

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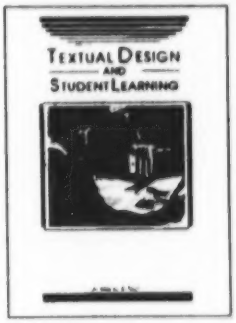

How important is typesetting, layout, the use of language and instructional design? This report shows how all are relevant to external students' learning.

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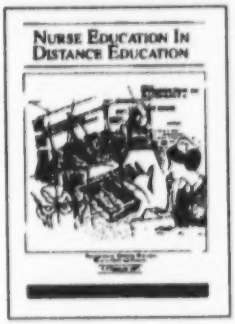
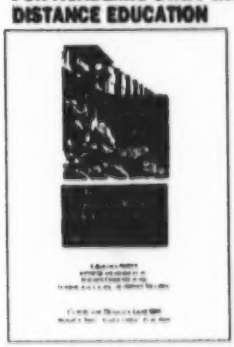


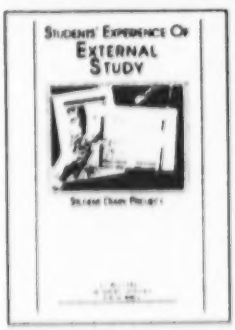
Training nurses at a distance. How to develop skills to plan, produce and improve study materials. A book to stimulate ideas and practices.

INSTITUTIONAL SUPPORT AND REWARDS FOR ACADEMIC STAFF INVOLVED IN DISTANCE EDUCATION



Institutional support is crucial for academics in Distance Education. An ICDE research project with 70 academics in four institutions analysing institutional policy and rewards for academics in Distance Education.

STUDENTS' EXPERIENCE OF EXTERNAL STUDY



Why do students study externally? How do they handle study guides and assignments? This details the importance of students' vocational, academic and personal orientation to study.

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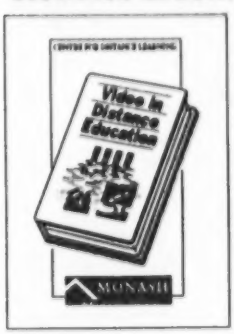

Explore the use of instructional video as you journey into one of the most exciting and creative fields of instructional media. It will open up endless possibilities for you and your learners.

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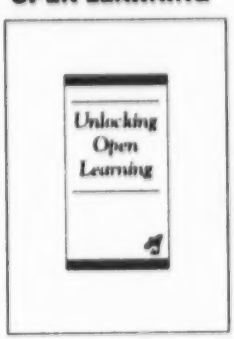

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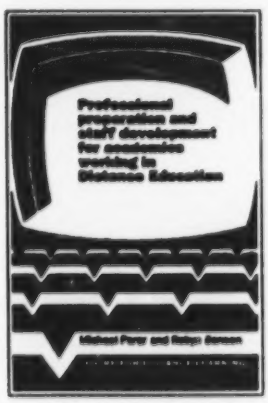

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